

REQUEST FOR PROPOSAL FOR

ESTABLISHMENT OF

WATER BASED FIRE PROTECTION SYSTEM AT

SEMICRYOGENIC INTEGRATED ENGINE TEST FACILITY

Volume 1

Executive Summary and Terms & Conditions

March 2018



ISRO Propulsion Complex

Indian Space Research Organization
Department of Space, Government of India
Mahendragiri 627133
Tirunelveli District, Tamil Nadu State, India





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GLOSSARY OF ACRONYMS

Acronym	Expanded Form
AERB	Atomic Energy Regulatory Board
AFFF	Aqueous Film Forming Foam
API	American Petroleum Institute
ASME	American Society of Mechanical Engineers
ASTM	American Society of Testing and Materials
BG	Bank Guarantee
BIS	Bureau of Indian Standards
BL	Bill of Lading
BOM	Bill of Materials
BS	British Standard
BSP	British Standard Pipe (thread)
CAD	Computer Aided Design
CD	Compact Disc
CDEC	Custom Duty Exemption Certificate
CENELEC	Commission of European Nations on Electro-technical Standardization
CS	Carbon Steel
CTR	Cable Terminal Room
DA	Di Acetylene
DB	Distribution Board
DC	Delivery Challan
DER	Detail Engineering Review
DG	Diesel Generator
DN	Diameter Nominal
DPT	Dye Penetrant Test
DSC	Digital Signature Certificate
DVD	Digital Video Disc
ELCB	Earth Leakage Circuit Breaker
EP	Electro Pneumatic
EPC	Engineering, Procurement and Construction
EPDM	Ethylene Propylene Diene Monomer
ERW	Electrical Resistance Welded (pipe)
FAT	Final Acceptance Test
FEED	Front-End Engineering Design
FFP	Firm & Fixed Price
FH	Fire Hydrant
FIM	Free Issue Material
FGL	Finished Ground Level
FM	Factory Mutual
FPS	Fire Protection System
FRLS	Fire Retardant Low Smoke
GAD	General Arrangement Drawing

GLOSSARY OF ACRONYMS

Acronym	Expanded Form
GLR	Ground Level Reservoir
GN ₂	Gaseous Nitrogen
GST	Goods and Service Tax
GTAW	Gas Tungsten Arc Welding
HVWSS	High Velocity Water Spray System
ID	Inner Diameter
IEC	International Electro-technical Commission
ILBP	In-Line Balanced Pressure
IP	Ingress Protection
IPRC	ISRO Propulsion Complex
IS	Indian Standard
ISO	International Standards Organization
ISRO	Indian Space Research Organization
JCMB	Joint Contract Management Board
JSA	Job Safety Analysis
LD	Liquidated Damage
LOX	Liquid Oxygen
LPG	Liquefied Petroleum Gas
LSTK	Lump-Sum Turn-Key
MAWB	Master Air Way Bill
MAWP	Maximum Allowable Working Pressure
MCC	Motor Control Centre
MCCB	Molded Case Circuit Breaker
MEOP	Maximum Expected Operating Pressure
MS	Mild Steel
MSL	Mean Sea Level
MSME	Micro, Small and Medium Enterprises
MVWSS	Medium Velocity Water Spray System
NC	Normally Closed
NDT	Non-Destructive Technique
NEC	National Electrical Code (USA)
NH	National Highway
NO	Normally Open
NPT(F)	(American) National Pipe Thread (Female)
NPT(M)	(American) National Pipe Thread (Male)
OD	Outside Diameter
OHSAS	Occupational Health and Safety Assessment Series
P&ID	Process and Instrumentation Diagram
PBG	Performance Bank Guarantee
PCC	Plain Cement Concrete
PCD	Pitch Circle Diameter

GLOSSARY OF ACRONYMS

Acronym	Expanded Form
PDI	Pre-Delivery Inspection
PDP	Power Distribution Panel
PERT	Project Evaluation and Review Technique
PPE	Personal Protective Equipment
PQ	Pre-Qualification
PSE	Public Sector Enterprises
PSR	Pre-Shipment Review
PSU	Public Sector Undertaking
PTFE	Poly Tetra Fluoro Ethylene
PU	Polyurethane
PUF	Poly Urethane Foam
QAP	Quality Assurance Plan
QC	Quality Control
RBI	Reserve Bank of India
RCC	Reinforced Cement Concrete
RCM	Resident Construction Manager
RF	Raised Face
RFP	Request For Proposal
RTGS	Real Time Gross Settlement
SD	Security Deposit
SIET	Sem icryogenic Integrated Engine Test
SMAW	Shielded Metal Arc Welding
SOV	Solenoid Valve
SRG	System Reliability Group
SS	Stainless Steel
SWG	Standard Wire Gauge
SWL	Safe Working Load
TCC	Test Control Centre
TCB	Techno-Commercial Bid
TPI	Third Party Inspection
UL	Underwriters Laboratories
UPS	Un-interrupted Power Supply



1.1. INTRODUCTION

ISRO Propulsion Complex (IPRC), Indian Space Research Organisation (ISRO), Department of Space, Government of India, Mahendragiri 627133, Tirunelveli District, Tamil Nadu State, India (hereinafter referred to as “Department”) intends to establish “Water Based Fire Protection System at Semi cryogenic Integrated Engine Test (SIET) Facility” at their premise. The SIET facility is intended to perform static tests for performance evaluation of Semi cryogenic propulsion systems of ISRO’s launch vehicles.

The Water Based Fire Protection System at SIET is to be established **on Lump-Sum Turn-Key (LSTK)** through **Engineering, Procurement and Construction (EPC)** Contract. The fire protection system under the proposed Contract comprise following systems:

- Fire Hydrant System
- Medium Velocity Water Spray System (MVWSS)
- High Velocity Water Spray System (HVWSS)
- In-Line Balanced Pressure (ILBP) Foam Proportioning System
- Remote Operated Long Range Water cum Foam Monitor
- First Aid Fire Hose Reel

The Department hereby issues this **Request for Proposal (RFP)** document to the Capable Bidders. The Department will organize a pre-bid meeting with the Bidders to facilitate proper understanding of the requirements and assessing the site conditions. **The potential Bidders should participate in the pre-bid meeting. Non-participation of Bidder in the pre-bid meeting will render their bid invalid.** The Bidders shall submit the bids in 2 (Two) parts viz. (i) Techno-commercial (non-priced) bid and (ii) Price bid. The Department will initially open the techno-commercial bids and, if necessary at their own discretion, organize post-bid techno-commercial meeting with the Bidders. The Department will initially evaluate the techno-commercial bids and shortlist the Suitable Bidders whose techno-commercial bids are compliant with the RFP specification and place them on equal footing. The Department will open the price bids of the Qualified Bidders only, hold post-bid price discussion, if necessary at their own discretion, and award the Contract based on the lowest-priced bid.

The execution period reckoned from signing of the Contract to final acceptance is **15 (Fifteen) months**. As this Project ensures the readiness of SIET facility which is of national interest and has to be completed within the stipulated period, the Bidders are advised to take utmost care in studying the quantum & nature of work and plan adequate & suitable resources to execute the Contract within the stipulated period while submitting the bids.



This RFP document comprises 2 Volumes. Executive summary and Terms & conditions and procedure for submission of bids are given in this Volume. Detailed technical specifications, scope of work and other specification/requirement are given in Volume 2 of this RFP document.

Some of the key terminologies used in this document are defined as follows:

- **“Department”** shall mean and include the President of India acting through the Director, IPRC and any representative(s) of the Department duly authorized on his/ her behalf.
- **“Contractor”** shall mean the individual or firm or company whether incorporated or not chosen by the Department among the Bidders to this RFP, undertaking the work and shall include the legal personal representatives of such individuals or the persons composing such firm or company or the successors of such firm or company and the permitted assignee of such individual or firm(s) or company.
- **“Party”** shall mean the any of the signatories to the Contract i.e. Department or Contractor or both.
- **“Sub-contractor”** shall mean individual or firm or company whom the Contractor engages for outsourcing certain service(s) related to the Contract.
- **“Sub-vendor”** shall mean individual or firm or company from whom the Contractor purchases certain material(s) related to the Contract.
- **“Contract”** shall mean the formal agreement to be executed between the President of India and the successful bidder based on the documents forming this RFP and any other mutual agreement and together with the documents as referred to therein including the specifications, designs, drawings and instructions issued from time to time by the Department.
- **“Date of Contract”** shall mean the date on which the Contract becomes effective with signing by all the Parties.
- **“S&FS”** shall mean Safety and Fire Services
- **“SIET”** shall mean Semi cryogenic Integrated Engine Test Facility.
- **“Site”** shall mean the land and or other places at Mahendragiri on which work is to be executed under the Contract which is to be allotted by the Department for the purpose of carrying out the work.
- **“Material”** shall mean all the goods/ items required for realizing and forming part of the Water based Fire Protection System at SIET facility



including raw materials, semi-finished & finished products & sub-assemblies & assemblies which are manufactured by the Contractor or their Sub-contractor(s) or bought-out from their Sub-vendor(s).

- **“Service”** shall mean all the activities performed by the Contractor for realizing the Water based Fire Protection System at SIET facility including design, detail engineering and onsite construction, fabrication, erection, testing & commissioning.
- **“Specification”** shall mean collectively all technical specification, terms and conditions contained in this document which shall be considered to realize the Water based Fire Protection System at SIET facility.
- **“Final acceptance”** shall mean acceptance of the entire Water based Fire Protection System at SIET facility by the Department from the Contractor upon successful completion of all contractual obligations by the Contractor and commissioning of the system.
- **“RFP”** shall mean this Request for Proposal for Establishment of Water Based Fire Protection System.
 - Volume 1 : Executive Summary and Terms & Conditions
 - Volume 2 : Technical Specifications and Scope of Work



1.2. **LOCATION AND LAYOUT**

1.2.1. **Geographical Location**

Mahendragiri is situated in Tirunelveli District, Tamil Nadu State, India. The nearest major town is Nagercoil which is 25 km southward. Mahendragiri is aside the Kanniyakumari - Madurai National Highway (NH7) near Kavalkinaru junction at a distance of 20 km northward from Kanniyakumari. The nearest major railway station is at Nagercoil. The nearest International airport is at Thiruvananthapuram which is 90 km away in south-western direction. The nearest seaport is at Thoothukudi which is 100 km away in north-eastern direction. The nearest major seaport is at Chennai which is 650 km northward.

1.2.2. **Site Location Plan**

SIET is located on a plain ground at an elevation of 144 m above Mean Sea Level in the North West region of IPRC, Mahendragiri. The site is leveled and provided with an approach road of width 5.5 m having 1 m berms on either side.

1.2.3. **Facility Layout**

The facility layout of SIET is given in Drawing No. LPSC/LMF/TSF/SCTF/EQL/DWG/01 - R5 in Volume 1.

The test stand has two bays i.e. Engine bay & Turbo pump bay. The size of the Turbo pump bay is 20 m x 20 m in plan and the height is 51m. Super structure has platforms at 16 m, 20 m, 24 m, 28 m, 32 m & 44 m levels of Turbo Pump bay. The size of the Engine bay is 20 m x 20 m in plan and the height is 31m. Superstructure has platforms at 16 m, 20 m & 24 m levels of Engine bay. Isrosene, LOX Start up tanks and LOX high pressure tank are mounted on the first platform which is at 16 m height from ground and the location of which is shown in equipment layout. The test stand area is provided with RCC pavement suitable for class AA loading. The flame deflector systems of Engine and stage bays face the western direction.

The Isrosene system and LOX system are located on either side of the test bays at ground and separated by a distance of about 120 m. Dike walls are planned around Isrosene and LOX tanks to contain spillage. The Isrosene system mainly consists of low pressure run tank, medium pressure run tank, drain tank, start-up tank, Isrosene tanker bay, heat exchanger, pump house, Isrosene vent stack and GN₂ pressurisation system. The LOX system mainly consists of low pressure run tank, medium pressure run tank, high pressure tank, start-up tank, LOX tanker bay, heat exchanger, LOX disposal pit and GN₂ pressurisation system. The LN₂ system consists of storage tank, heat exchanger and vaporizer unit.



The entire layout encompassing these process systems is provided with fence to prevent any unauthorized entry. The Cable Terminal Room (CTR) and the Motor Control Centre (MCC) are located at north – east side of LOX system. An exclusive above the ground cable corridors is provided between CTR and Test Stand. The other service and utility rooms such as operator's room, safety room, storage yard, field assembly room, radiography room, etc. are located near the entry point of test facility outside the main fencing.

1.2.4. **Layout of Water Based Fire Protection System**

The tentative locations for fire hydrants, deluge valves and foam skid, remote operated long range water cum foam monitor at SIET Facility are shown in the Drawing No. IPRC/S&FS/SIET/Fire Fighting Systems/R1.

1.2.4.1. **Ground Level Reservoir (GLR)**

1100 m³ GLR for SIET's firefighting system is located at an elevation of 135m from the Finished Ground Level (FGL) of SIET. Department will provide two tapping points at the locations shown in the layout drawing. Contractor shall establish the fire protection systems at SIET from tapping point as per the P&ID. The approximate distance between the GLR and the tapping points at SIET is about 1500 m.

1.2.4.2. **Fire Hydrant System**

Fire hydrants shall be installed in the locations shown in the layout drawing. Fire hydrant outlet shall be situated 1 meter above the Finished Ground Level. Fire hydrant stand pipe shall be provided with PCC at the base at least 1000 mm x 1000 mm. Each fire hydrant shall be provided with fire hose cabin at distance of 1500 mm from hydrant stand pipe. 1000 mm width paved pathways shall be provided to approach fire hydrants and fire hose cabins.

1.2.4.3. **Deluge System**

To provide exposure protection to tanks from external fire, Medium Velocity Water Spray System (MVWSS) operated by deluge valves are planned. Isrosene tanks/ tanker and LOX tanks/ tankers are to be protected and the tentative locations for positioning of deluge valves are shown in the layout drawing. At Isrosene area 4 numbers of deluge valves and LOX area 3 numbers of deluge valves to be positioned. Contractor shall propose the area required for positioning the deluge valves, design and construct the deluge valve shed. In deluge valves shed, all flow components as per the P&ID shall be accommodated. The area shall include space for access and to carry maintenance work. Suitable structural platforms with necessary access shall also be planned for operation of deluge valve. Suitable drainage arrangement



shall be made to drain the water from drain point of deluge valve and storm water.

High Velocity Water Spray System (HVWSS) operated by Electro Pneumatic Valve is planned in the test bay area covering the engine bay, stage bay, LOX high pressure tank and LOX start-up tank. The flow components shall be suitably positioned at test stand bay as per the P&ID.

1.2.4.4. In-Line Balanced Pressure (ILBP) Foam Proportioning System

In-Line Balanced Pressure (ILBP) Foam Proportioning System, consisting of 12m³ foam Concentrate tank, foam pump, foam proportionaters and other flow components shall be positioned in the foam skid shed at the tentative location shown in the layout drawing. The Identified area for Foam skid is 22000mm x 6500mm and is designed with the loading capacity for 10T/m². However, Contractor shall propose the area required for installation of foam skid and design the foundations for the foam tank and foam pump. The area shall include space for access and to carry maintenance work. Suitable structural platforms with necessary access shall also be planned for operation of foam system. Suitable drainage arrangement shall be made to drain the water from drain point of foam propotionating system and storm water.

1.2.4.5. Remote Operated Long Range Water cum Foam Monitor

Remote operated long range water cum foam monitors shall be installed in the locations shown in the layout drawing. It shall be mounted on an elevated platform and the size of the platform is 2m x 2m and the height is 5m from the FGL. The staircase for the elevated platform shall conform to relevant IS standards.

1.2.4.6. First-aid Fire Hose Reel

First-aid fire hose reel shall be located at Isrosene handling area, LOX handling area and at each platform levels of test stand structures at both Engine Bay and Turbo Pump Bay.

1.2.4.7. Routing of Pipelines

The fire protection system pipelines are routed along the side of the fence and the pipe routing shall be as per the piping layout. Generally, the piping shall be routed above the ground level by means of pipe racks at an elevation of 5m inside the test stand facility. The pipe rack structural supports and foundations shall be suitably designed. In downstream of deflector pit, the fire hydrant pipeline and the water monitor pipelines shall be routed below the ground level and it shall be suitably protected by anti-corrosive wrapping and coatings.



1.2.5. **Climatic Condition**

The climatic condition at Mahendragiri is tropical and windy with gusts. Normal monsoon period is June-July and October-November. The typical climatological data of Mahendragiri is as follows:

Rainfall

- Maximum daily rainfall : 50 mm
- Maximum monthly rainfall : 120 mm
- Average annual rainfall : 550 mm

Temperature

- Maximum temperature in shed : 311 K
- Minimum temperature : 293 K

Humidity

- Maximum relative humidity : 80%
- Minimum relative humidity : 25 %
- Climate : Tropical

Wind Load

Wind load shall be taken as per IS:875 Part 3 - 1987.

Seismic Zone

The systems shall be designed for seismic load conforming to Zone 3 as per IS:1893 latest edition.



1.3. **SUMMARY OF SCOPE OF CONTRACT**

A brief summary of the overall responsibility of the Department, the scope of work by the Contractor and the mutual obligations is given in this Section. Detailed scope is given in Volume 2 of this RFP document.

1.3.1. **Department's Responsibility**

Toward establishment of Water based Fire Protection System at SIET facility, the Department shall provide the following:

1.3.1.1. **Front-End Engineering Design:** The Department has done the Front-End Engineering Design (FEED) of the system. In this RFP document, the following FEED documents are given which shall be the input for establishment of Fire Protection Systems at SIET:

- i. Location and layout drawing of Fire Protection Systems
- ii. Process & Instrumentation diagram of Fire Protection Systems
- iii. Process Design Basis
- iv. Major specification of materials and services

Upon award of the Contract, the Department will organize, in consultation with the Contractor, a FEED review meeting at their office (Mahendragiri), in which the Contractor's representative(s) shall participate.

1.3.1.2. The Department will review the Detail engineering to be done by the Contractor.

1.3.1.3. **Services:** Department will provide following services during installation, testing and commissioning

- **Process Fluids:** The Department will provide, free of cost, the process fluids such as GN₂ for commissioning.
- **Temporary Electrical Power Supply:** Department will supply temporary electrical power supply for onsite fabrication/ erection activities at a fixed point in MCC room on chargeable basis (Applicable charge is Rs.8/- per kW-h as on date). The Contractor shall not, however, have any claim against the Department in the event of failure, interruption/ insufficiency of these services. If required, the Contractor may employ a portable Diesel Generator (DG) set to get uninterrupted power supply.
- **Water Supply:** The water supply for temporary onsite fabrication, erection activities, testing and commissioning of fire protection systems shall be drawn from the bore wells at SIET at the location shown in layout drawing no. LPSC/LMF/TSF/SCTF/EQL/DWG/01-R5 of this RFP document. Department shall provide water supply, free of cost, at a fixed point. However, Contractor shall arrange all the materials to draw the water from bore wells and cater it to the required location.



- 1.3.1.4. Instrumentation System: The instrumentation works such as tubing for Solenoid Valve (SOV) & cabling for EP valves, mounting of pressure indicators and its cabling shall be realized by the Department.
- 1.3.1.5. Electrical System: The Department shall provide the electrical power at MCC room. The Contractor shall tap the electrical power to respective panels at MCC.
- 1.3.1.6. Commissioning (jointly with Contractor): The Department will review operating procedures, preparedness of systems and trial results.
- 1.3.1.7. Inspection at Worksite: Department's representative shall inspect the worksite at any time during work execution to ensure Safety & Quality at the worksite.
- 1.3.1.8. The Department will provide at site, free of cost, space for construction of temporary Contractor office, a room for proper storage of flow components, fabrication shed. Contractor shall establish it at their own cost, only at the designated locations after Department's consent.

1.3.2. **Contractor's Scope**

The brief scope of works to be done by the Contractor for the establishment of Fire Protection Systems at SIET is given in this Section.

1.3.2.1. **FEED Review**

The Contractor shall review the FEED document submitted by the Department. The objective of the FEED review is to arrive at a consensus between the Department and the Contractor on the basic design of Fire Protection Systems and to freeze the input data for the detail engineering to be done by the Contractor. However, in case of dispute between the Department and the Contractor, the details of FEED specified in the Contract shall be final. The design calculations are based on the codes/ standards mentioned in various Sections of this document. In case the Contractor prefers to employ alternative codes/ standards, the Department may agree, provided the alternative codes/ standards shall be equal to or superior than those specified in the contract. In such cases where the Contractors employ alternative codes/ standards, it shall be their responsibility to submit a copy of such codes/ standards in English language to the Department during FEED review.

The FEED review shall primarily address the following issues:

- a. Verification of P&IDs to comply with the specified functional requirements
- b. Adequacy of the sizes of fluid circuits comprising pipelines, flow components, instruments, etc. to comply with the specified process parameters
- c. Adequacy of the in-built safety features



Once the process design review is completed, the Contractor has to jointly own responsibility for the process design.

1.3.2.2. Detail Engineering

Based on the approved design evolved during FEED review, the Contractor shall carry out detail engineering of the systems. The scope of detail engineering and the documents to be submitted thereupon is given in Volume 2 of this RFP document. The following general points shall be applicable:

- a. A 3-dimensional model shall be generated for the Fire Protection Systems. The routing of the pipelines, supports of the pipes, location of fire hydrants, deluge systems, routing of cables etc. at various locations of the test facility shall be suitably incorporated. The interference with other structures, equipment, shall be avoided. Department shall provide the piping & equipment layout drawing and isometric drawing of the Fluid Service Systems (FSS) to Contractor for this purpose.
- b. The detailed Quality Assurance Plan (QAP) for the materials/ services shall be provided. The QAP shall address such factors as object tested, characteristics sought for, sample size, test procedure/ standard, acceptance criteria, form of record, performing agency, witnessing agency, reviewing agency, etc.
- c. The purchase specification of the materials/ services shall be provided.
- d. The list of Sub-vendors from whom the Contractor has finalized (from the directory given in the Contract) to purchase the materials/ services shall be provided.
- e. The list of spares to be supplied shall be provided.

The Contractor shall organize a meeting at their premise/ IPRC for detail engineering review by the Department. However, the participation of and approval by the Department's representatives during the Detail engineering review shall not absolve the Contractor of their responsibility to comply with the specification of the Contract.

Upon Detail engineering review, if changes are found to be necessary to comply with the intended functional scope of the Contract, the Contractor, at their own cost, shall carry out such changes.

1.3.2.3. Purchase Of Materials

All the materials are to be purchased by the Contractor. The general specifications of the materials are given in Volume 2 of this RFP document. The detailed purchase specifications for the individual items of materials to be purchased shall be made by the Contractor. The purchase specifications of such materials, which are not in accordance with the specification in the Contract, shall be subject to review and approval by the Department.



1.3.2.4. Purchase Of Spares

The description/ quantity of spares to be supplied are given in Volume 2 of this RFP document. The following common guidelines shall be applicable for finalizing the types and quantities of spares. Nevertheless, wherever specific items/ quantities/ percentage of spares are mentioned in Volume 2 of this RFP document, the same shall take precedence.

- 1.3.2.4.1. Spare parts for flow components: For the flow components used in establishment of Fire Protection Systems at SIET, the Contractor shall supply essential spare parts for 40% of particular category and size (like seat insert, body gasket, gland packing, plug stem assembly etc. for valves) and cost shall be included in the individual basic item. The spare parts allocated for this purpose shall not be consumed by the Contractor during erection and commissioning. In case of emergency, the Department may allow the Contractor to utilize these spare parts during erection and commissioning and the Contractors shall replace the same free of cost.

- 1.3.2.4.2. Spare parts and consumables for erection and commissioning: For the materials used in establishment of Fire Protection Systems at SIET, the Contractor shall deliver the spare parts and consumables to be replaced/ used during erection and commissioning.

1.3.2.5. Training

The Contractor shall provide on-the-spot training to the Department's representatives to impart essential knowledge on design, constructional features, assembly, testing, calibration, servicing, operation and maintenance of Fire Protection Systems.

1.3.2.6. Inspection

The Contractor shall be responsible for arranging inspection of all materials/ systems purchased by the Contractor. Upon completion of product production/ shop fabrication, the Contractor shall organize Pre-delivery inspection review by the Third Party Inspection Agency. The detailed scopes of inspection are given in Section 1.5.6 of this RFP document.

1.3.2.7. Packing, Transportation, Storage and Handling of Materials

The Contractor shall be responsible for packing, transportation, storage and handling of materials as per Section 0. of this RFP document.

1.3.2.8. Onsite Construction, Fabrication, Installation and Testing

The detailed specification of construction, fabrication, installation and testing are given in Volume 2 of this RFP document.

The Contractor shall arrange for constructing temporary sheds/ buildings for storing materials at SIET, erection equipment, tools & tackles, site office, etc. The Contractor's personnel shall not be permitted to reside inside the



Department's premises after the work. The Contractor shall arrange for transportation, accommodation, food, health care, etc. for their personnel.

1.3.2.9. Insurance

The Contractor shall be responsible for insurance as per Section 1.5.8. of this RFP document.

1.3.2.10. Commissioning

The Fire Protection Systems established at SIET shall be commissioned jointly by the Department and the Contractor. Detailed scopes are given in Volume 2 of this RFP document.

1.3.2.11. Documentation

The Contractor shall be responsible for documentation and the detailed lists of documents to be submitted shall be as per Section 1.5.12 of this RFP document.

1.3.3. **Mutual Obligation**

1.3.3.1. If not otherwise explicitly stated in the Contract, either Party shall be responsible for obtaining any Government permission/ approval required regarding the terms and conditions of this Contract.

1.3.3.2. Deputation Of Representatives

In order to fulfill the obligation of the Contract, both Parties shall depute and the other Party shall receive their representatives for the following purposes:

1.3.3.2.1. The Contractor's representatives shall visit the Department's premise for participation in

- a. FEED review/ Detail Engineering
- b. Onsite construction, fabrication, erection and commissioning
- c. Rectification of defect, if any, during the warranty period
- d. Training

1.3.3.2.2. The Department's representatives shall visit the Contractor's premises for participation in

- a. Detail engineering review
- b. Inspection/ progress review during fabrication
- c. Pre-delivery inspection

1.3.3.2.3. The list of the representatives deputed as well as the period of stay shall be intimated by either Party to the other 3 (Three) weeks in advance prior to the date of arrival.



- 1.3.3.2.4. All the expenses for deputation of representatives of either Party shall be borne by themselves.
- 1.3.3.2.5. The representatives of the visiting Party shall observe the laws, rules and regulations, which are in force in the receiving Party's premises.
- 1.3.3.3. The Parties shall carry out joint technical and managerial reviews on the progress of execution of the Contract as required on mutually agreed schedules.

1.4. **PRE-QUALIFICATION CRITERIA**

The Bidder's capability will be evaluated based on the following Pre-Qualification (PQ) criteria. The Bidders shall suitably fill-up the following information solicited and submit as part of the Techno-Commercial Bid (TCB) along with supporting documents. Those Bidders who fulfill with the PQ criteria only will be screened-in for opening and evaluation of Price Bid. **Any lack of information or incomplete/ambiguous information or non-compliance with the PQ criteria will be treated as sufficient cause to summarily reject such Bids.**

The bidder must be in the business of establishment of water based fire protection system and must have experience in successful execution of EPC (Engineering, Procurement and Construction) projects.

- a. The Bidder must have successfully completed similar EPC project for values as follows during the last 7 (Seven) years ending 31/03/2017. Such EPC project shall involve detail engineering, procurement, supply, fabrication, erection/ installation and commissioning relating to piping, structural, electrical works including establishment of water based fire protection system. Escalation at the rate of 7% per full year may be added on the annual turnover as well as price of previously completed works to arrive at the present value as on 31/03/2017.
- 1 work (single purchase order) of price equal to or more than Rs.10 Crores.
(or)
 - 2 works with price of each work equal to or more than Rs.6 Crores.
(or)
 - 3 works with price of each work equal to or more than Rs.5 Crores.

Documentary evidence in support of the above jobs in the form of purchase orders and final completion certificates from the clients are to be submitted failing which the offers will be rejected.

- b. The Bidder shall have an Average Annual Financial Turnover of minimum Rs. 5.0 Crores during the last 3 (Three) years ending 31.03.2017. Documentary evidences in the form of Audited Balance sheet and Profit and Loss Account for the last 5 (Five) years ending 31.03.2017 shall be submitted along with the Techno-commercial bid towards proof of having Annual Turnover as stated above. They must have made profit at least 3 (Three) out of last 5 (Five) years.

1.5. **TERMS & CONDITIONS**

General, commercial and legal terms and conditions to be incorporated in the Contract to be entered into between the Department and the Contractor are given in this Section. In the event of conflict between the terms & conditions given in this Section and the specification of systems given in Volume 2 of this RFP document, the latter shall take precedence.

Standard formats for Bank Guarantee (BG), Indemnity bond and Performance Bank Guarantee (PBG) shall be provided to the successful bidder along with the contract. Contractors who are Public Sector Enterprises under Government of India may provide Indemnity bond in lieu of BG/ PBG.

1.5.1. **Contract Structure**

1.5.1.1. **Entire Agreement**

The Contract to be entered into shall convey the final agreement between the Department and the Contractor on the terms and conditions and be a complete & exclusive statement of the terms of the agreement.

1.5.1.2. **Mode of Operation**

The Contractor shall be responsible for the overall Project management of the Contract and directly accountable to the Department for complete fulfillment of all the contractual obligations.

1.5.1.3. **Effective Date of Contract**

The Contract shall become effective from the date of signing by the Parties. The “Date of Contract” referred to in this document shall mean the effective date of the Contract.

1.5.1.4. **Amendment to Contract**

The Contract may be modified only in writing by an Amendment signed by both the Parties. The Amendment shall be treated as integral part of the Contract. The terms & conditions and specification of the Contract shall be applicable to the Amendment also except to the extent specifically modified in the Amendment.

1.5.1.5. **Cancellation of Contract**

1.5.1.5.1. The Department will have the right, at any time, to cancel the Contract either wholly or in part by giving written notice 1 (One) month in advance. The Contractor shall undertake to observe the instructions of the Department as to the winding up of the Contract both on their own part and on the part of their Sub-contractor(s).

1.5.1.5.2. In the case of cancellation of the Contract by the Department without any fault of the Contractor, the Contractor shall forthwith take the necessary steps to



implement the Department's instructions. The period to be allowed to implement shall be fixed by the Department after consultation with Contractor and, in general, shall not exceed 3 (Three) months.

- 1.5.1.5.3. Subject to the Contractor conforming to the instructions given above, the Department will take over from the Contractor, at a fair and reasonable price, all finished parts not yet delivered to the Department, all unused and undamaged materials, bought-out components and articles in course of fabrication in the possession of the Contractor for the performance of the Contract, except such material, which the Contractor shall, with the agreement of the Department, elect to retain.
- 1.5.1.5.4. The Department will, in no circumstance, be liable to pay any sum which, when added to the other sums paid, due or becoming due to the Contractor under the Contract and its Amendment, if any, exceeds the total payment for the work set forth in the Contract and its Amendment, if any.
- 1.5.1.5.5. The ownership of all materials, part and unfinished work paid for by the Department under the provisions of this Section shall be vested in or transferred to the Department as soon as they have been paid for.
- 1.5.1.6. Contractor's Default Liability
 - 1.5.1.6.1. The Department shall reserve the right to terminate the Contract in the circumstances detailed hereunder upon issue of 1 (One) month prior notice of default to the Contractors:
 - a. If the Contractor fails to execute the Contract, due to reasons not attributable to the Department, within the period specified in the Contract or within the period for which extension may be granted by the Department.
 - b. If the Contractor fails to rectify, reconstruct or replace any defective system/ subsystem/ equipment within a period of 30 (Thirty) days from the date of notice issued by the Department or if the Contractor delays, suspends or is unable to complete the system/ subsystem/ equipment by the date mutually agreed upon.
 - c. If the Contractor commits breach of any terms and conditions of the Contract after the Contractor has been given a reasonable period of time to make good the breach.
 - d. If the Government of India decides to terminate the Contract in public interest.
 - 1.5.1.6.2. When the Contractor makes themselves liable for action under the circumstances mentioned above, the Department will have the power to forfeit



any BG or SD submitted by the Contractor and the Contractor shall have no claim for damages whatsoever on such forfeiture.

- 1.5.1.6.3. The work remaining to be completed at the time of termination of the Contract shall be got executed through any other Contractor, in which case the expenses, which may be incurred in excess of sums, which would have been paid to the original Contractor, had the whole work been executed by them, shall be recovered from the original Contractor.
- 1.5.1.6.4. If the work happens to be terminated as provided in Section 1.5.1.6.1, the Department, in addition to any other right provided, may require the Contractor to change the title and deliver to the Department in the manner and as directed by the Department
 - a. Any completed system/ subsystem/ equipment
 - b. Such partially completed system/ subsystem/ equipment/ drawings/ information, which Contractor specifically produced/ acquired for the performance of the work
- 1.5.1.6.5. The Department will pay to the Contractor, as per mutually agreed price, for completed system/ subsystem/ equipment delivered to and accepted by the Department and for manufacturing materials delivered and accepted. For the partially completed system/ subsystem/ equipment delivered to and accepted by the Department, payment will be made at mutually agreed prices. After termination of the Contract, the balance items of work shall be executed by the Department through other agencies.
- 1.5.1.6.6. Intermediary agent: The Contractor shall declare that no company, firm or person other than full time bona-fide employee working solely for the Contractor has been employed or retained by the Contractor to solicit or secure this Contract and that the Contractor has not paid to any company, firm or person any fee, commission or brokerage contingent upon or resulting from the award of this Contract. If, at any time, it is found that the Contractor has made a false declaration to this effect, the Department shall be entitled to terminate the Contract. All the consequences of termination shall be at the Contractor's risk and cost.

1.5.2. **Security Deposit**

The Contractor shall provide Security Deposit (SD) for a sum equal to 10% of the total Contract price within 1 (One) month from the date of Contract. It shall be in the form of BG from a nationalized/scheduled bank approved by Reserve Bank of India (RBI) valid till final acceptance of Fire Protection Systems established at SIET with additional claim period of 2 (Two) months. In the event of non-execution of the Contract or breach of Contract terms & conditions by the

Contractor, the Department shall en-cash the SD. Upon successful execution of the Contract in all respects by the Contractor and final acceptance of Fire Protection Systems established at SIET by the Department, the SD will be discharged by returning the BG to the Contractor. Alternatively, the SD may be extended and converted into PBG as per Section 1.5.11.2. MSMEs & PSEs/PSUs are exempted from furnishing of BG towards Security Deposit instead they have to furnish Indemnity Bond. MSMEs are exempted up to their registered monetary limit only.

1.5.3. **Price and Payment Term**

1.5.3.1. **Price**

1.5.3.1.1. The Contract shall be on **LUMP-SUM TURN-KEY (LSTK)** basis through **Engineering, Procurement and Construction (EPC)** Contract on **FIRM & FIXED PRICE (FFP)** basis during the entire Contract period.

1.5.3.1.2. The quantities of materials and services mentioned in this RFP document are tentative & based on preliminary estimation and shall not be binding on the Department. The Bidder shall clearly estimate, on their own, the quantity of materials and services required to comply with the overall intended functional scope of this RFP document and quote the lump-sum price accordingly. The materials or services that may not have been listed in this RFP document but are necessary to comply with the functional scope shall also be included in the lump-sum price.

1.5.3.1.3. There shall not be any change in the Contract price permissible on account of changes in materials or services arising out of technical reviews (FEED review, Detail engineering review, etc.) or actual site conditions or any other reason whatsoever so as to comply with the intended functional scope of the Contract. The Bidder shall envisage such changes and quote the lump-sum price accordingly.

1.5.3.2. **Tax and Duty**

1.5.3.2.1. The Bidder shall quote, separately in the price bid, applicable Goods & Service Tax levied by the Central or State Government within India for materials or services at the rates prevailing at the time of submission of bid. In case of any change in rate or structure of taxes, duties or levies by the Central or State Governments within India, taxes shall be reimbursed at actuals. IPRC is eligible for concessional rates of GST under relevant notifications (presently @ 5%). Exceptions certificate shall be issued for supplies of Goods only.

1.5.3.2.2. Any royalty, commission or other attendant/ incidental charge/ fee payable to any agency/ body other than the Central or State Governments within India for



materials or services shall be indicated separately, preferably as percentage (%).

- 1.5.3.2.3. Any tax, duty, levy, royalty, commission or other attendant/ incidental charge/ fee, etc payable outside India shall be payable by the Contractor.
- 1.5.3.2.4. The Department shall reimburse Goods and Service Tax (GST) as applicable for the indigenous materials & services under the Contractor's scope at actual, at the rate prevailing at the time of transaction. Any other provisions of the GST Act or relevant Notifications issued by the Government of India in respect of the same shall also be implemented if applicable to this Contract. The GST registration number of the Department is 33AAAGI0056H1ZV.
- 1.5.3.2.5. The Department will issue Custom Duty Exemption Certificate (CDEC) for the imported materials against proforma invoice submitted by the Foreign Contractor/ Sub-vendor. The CDEC will be issued for the imported materials covered under Notification # 50/2017 Dated 30 June 2017.
- 1.5.3.2.6. For the materials manufactured in Special Economic Zones in India, the Department shall issue CDEC.
- 1.5.3.2.7. The Department shall make statutory deduction on account of Income tax as per the extant provisions of the Indian Income Tax Act, 1961 and issue "Tax Deducted at Source (TDS)" certificate to the Contractor.

1.5.3.3. Payment Term

The Contract price shall be paid in phases as per the following terms:

1.5.3.3.1. Advance Payment

The Department does not normally entertain advance payment. However, in case the Bidder proposes for advance payment, the Department may consider it, subject to the following conditions.

- a. BG for an equivalent sum from a nationalized/ scheduled bank approved by RBI or a reputed first-class international bank valid till final acceptance of Fire Protection Systems established at SIET with additional claim period of 2 (Two) months is to be submitted.
- b. In case of different advance payment terms proposed by the Bidders, the Department will load simple interest on the advance payment over the execution period in accordance with MCLR as notified by RBI applicable on the due date for submission of bid for comparison of the price bids.
- c. Moreover, in case of delay in execution of the Contract by the Contractor beyond the stipulated period due to reasons not attributable to the



Department, the Department will recover interest on the advance payment over the period of delay at the bank rate notified by RBI applicable on the date of final acceptance of Fire Protection Systems established at SIET. (This is over and above LD as per Section 1.5.4.2)

1.5.3.3.2. Milestone Payment

- a. The Department will make milestone payments on pro-rata basis upon delivery of material/ execution of services. The percentage of milestone payment shall be 100% minus percentage of advance payment, if any, minus 10% (i.e. percentage of final payment).
- b. The milestone payments on pro-rata basis shall be based on the unit price of material/ service in the billing breakup to be mutually agreed upon as per Section 1.5.3.5.
- c. 100% of the applicable taxes, duties, levies, etc will also be paid along with the milestone payment.
- d. The invoice for each milestone payment for delivery of material shall be accompanied by
 - i. Certification by the Department of having accepted the Pre-Delivery Inspection (PDI) document
 - ii. Certificate of country of origin (for imported materials)
 - iii. Packing list/ Delivery Challan (DC) showing dimensions, gross mass, net mass, quantity & content of packages
 - iv. Non-negotiable copy of Lorry Receipt (LR)/ Bill of Lading (BL)/ Master Air Way Bill (MAWB)
- e. The invoice for each milestone payment for service shall be accompanied by certification by the Department to the effect that the Contractor has completed the service satisfactorily.

1.5.3.3.3. Final payment

The retention sum of 10% of the total Contract price will be paid upon final acceptance of Fire Protection Systems established at SIET. Besides, the final payment shall also include shortfall, if any, in milestone payments based on payment reconciliation to be mutually worked out between the Department and the Contractor. The invoice shall be accompanied by

- a. Final acceptance certificate by the Department upon successful completion of all contractual obligations by the Contractor, commissioning including Performance Evaluation Test of Fire Protection Systems.



b. Payment reconciliation statement

c. Warranty certificate

d. PBG as per Section 1.5.11.2.

1.5.3.4. Mode of Payment

1.5.3.4.1. All payments to the Contractor will be made through Real-Time Gross Settlement (RTGS).

1.5.3.4.2. The payments will be made within 30 (Thirty) days from the date of receipt of the original invoice along with requisite and clean documents required as per the Contract at the Department's end.

1.5.3.5. Billing Breakup

1.5.3.5.1. Upon signing of the Contract, the Department and the Contractor shall mutually arrive at the billing breakup giving the breakup details of the quantity and unit price of major materials and services.

1.5.3.5.2. The total price of the billing breakup shall equal the total Contract price. The details of minor and miscellaneous materials/ services may be clubbed with the concomitant major materials/ services.

1.5.3.5.3. The billing breakup is exclusively for the purpose of making milestone payments on pro-rata basis as per Section 1.5.3.3.1

1.5.3.5.4. The Department will make payment to the Contractor based on the prices as per the billing breakup.

1.5.3.5.5. In case the quantity of particular material/ service actually delivered/ executed is more than that mentioned in the billing breakup, the milestone payment will be limited to the extent of the quantity of material/ service mentioned in the billing breakup.

1.5.3.5.6. In case the quantity of particular material/ service actually delivered/ executed is lesser than that mentioned in the billing breakup, the milestone payment will be limited to the extent of the quantity of material/ service actually delivered/ executed. In such case, the shortfall in price payable will be worked out during payment reconciliation phase upon final acceptance of Fire Protection Systems established at SIET and paid to the Contractor along with the Final payment such that the cumulative sum of all payments made (comprising advance, milestone and final payments) equals the total Contract price.

1.5.3.5.7. In case any material other than those listed in the billing breakup is required, the Contractor may supply the same with zero-valued invoice, in which case no



payment will be made to the Contractor. However, the applicable taxes/ duties as per the Sub-contractor's/ Sub-vendor's invoice will be paid at actual.

1.5.4. **Execution Period**

The overall execution period of the Contract reckoned from the effective date of Contract (i.e. signing of the Contract by all the Parties) to the date of final acceptance of Fire Protection Systems established at SIET by the Department shall be **15 (Fifteen) months**.

1.5.4.1. **Progress Review and Monitoring**

The Bidder shall submit, along with the techno-commercial bid, a detailed schedule breakup, preferably in the form of Gantt chart, indicating target start & finish dates of various major activities in different phases so as to comply with the overall execution period. The major phases include

- a. FEED review
- b. Detail engineering of various systems
- c. Procurement of equipment & materials, shop fabrication, testing & transportation to site
- d. Onsite activities such as site development, construction, fabrication, erection, testing & inspection
- e. Commissioning jointly with the Department.

This schedule shall form the basis for all the works to be performed by the Contractor.

Project management to complete the Contract within specified time, price and performance/ quality parameters shall be the responsibility of the Contractor. The Contractor and the Department shall identify Contract Managers for their respective sides. Within 1 (One) month from the date of Contract, the Contractor shall prepare a detailed schedule chart (by Project Evaluation & Review Technique or Critical Path Method) for the overall execution period. For each subsystem or work package, an independent schedule chart is to be prepared. The schedule chart shall be updated every month. The deviation, if any, is to be clearly documented and possible end effects brought out at each phase. The preparation of all documentation for reviews and meetings are the Contractor's responsibility. Progress shall be monitored by both the Contract Managers on regular basis. The frequency of review at the final phase of the Contract shall be suitably increased to resolve any outstanding issue. It is to be noted that the schedule is the essence of the Contract and work progress shall be closely monitored and appropriate actions shall be taken wherever necessary.



1.5.4.2. Liquidated Damage for Delayed Execution

Except in case of Force *majeure* circumstance as given in Section 1.5.4.3 or due to reasons attributable to the Department, if the Contractor fails to execute the Contract within the execution period or any extension agreed thereof, the Department shall recover, from the Contractor as Liquidated Damage (LD), a sum of 0.5 % of the total Contract price for each calendar week of delay. The total LD shall not exceed 10% of the total Contract price. The Contract shall be deemed to have been executed only when the entire Fire Protection System established at SIET is finally accepted by the Department upon successful commissioning. If certain components/ subsystems/ systems are not delivered/ executed or are not accepted due to deficiency in performance/ workmanship wholly or partly, it shall be considered that the execution is delayed until such time the deficiencies are rectified by the Contractor and the components/ subsystems/ systems are accepted by the Department.

The following points are clarified with regard to applicability of LD:

- a. The LD will not be restricted to undelivered/ unexecuted portion of the material/ service only.
- b. The LD will not be partially waived if any individual constituent system/ subsystem are completed on time as per intermediate milestone in the schedule chart.

1.5.4.3. Force *Majeure* Circumstance

Neither party shall bear responsibility for the complete or partial non-performance of any of their obligations (except for failure to pay any sum which has become due on account of receipt of goods under the provisions of the Contract) if the non-performance results from such force *majeure* circumstances such as, but not restricted to, flood, fire, earthquake, civil commotion, sabotage, explosion, epidemic, quarantine restriction, strike, lock-out, freight embargo, acts of the Government either in its sovereign or contractual capacity, hostility, acts of public enemy and other acts of God as well as war or revolution, military operation, blockade, acts or actions of State authorities or any other circumstance beyond the control of the parties that have arisen after the conclusion of the Contract.

In such circumstances, the time stipulated for the performance of an obligation under the Contract may be proportionately extended.

The Party, for whom it has become impossible to meet the obligation under the Contract due to force *majeure* condition, will notify the other Party in writing not later than 21 (Twenty One) days from the date of commencement of the unforeseeable event. Unless otherwise directed by the Department in writing, the Contractor shall continue to perform their obligations under the Contract as



far as is practical and shall seek all reasonable alternative means for performance not prevented by the force *majeure* event.

Any certificate issued by the Chamber of Commerce or any other competent authority or organization of the respective country shall be sufficient proof of commencement and cessation of the above circumstances.

In case of failure to carry out complete or partial performance of an obligation for more than 60 (Sixty) days, either Party shall reserve the right to terminate the Contract totally or partially. A prior written notice of 30 (Thirty) days to the other Party will be given informing of the intention to terminate without any liability. This is exclusive of any reimbursement for the goods received as provided for in the agreement.

1.5.4.4. Cycle Time for Approval

The Department will communicate their disposition (approval, rejection or comment) of the design & engineering documents, pre-delivery inspection documents and Contractor's proposal for incorporation of additional Sub-contractor/ Sub-vendor within 10 (ten) working days from the date of receipt, at the Department's end, of such documents, provided that the documents received are complete and in compliance with the contractual obligations.

The Department will also provide CDEC for materials within 10 working days from the date of receipt, at the Department's end, of request for the same accompanied by requisite documents in compliance with the contractual obligations.

1.5.5. **Sourcing of Materials/ Services**

The Contractor shall source the materials/ services required for executing the Contract from Sub-vendors/ Sub-contractors of requisite standard, competence and quality-consciousness.

1.5.5.1. Selection of Sub-Vendor/ Sub-Contractor

The Sub-vendors/ Sub-contractors, who, in the opinion of the Department, are competent enough to deliver the materials or execute the services required for establishment of the system, are given in the directories in Volumes 2 of this RFP document. In case the Bidder proposes sourcing the materials/ services from Sub-vendors/ Sub-contractors not covered in the directories given in this RFP document, the list of such Sub-vendors/ Sub-contractors, along with their detailed company profile, shall be provided in the bid. The list of additional Sub-vendors/ Sub-contractors proposed by the Bidder is subject to review, during evaluation of the bid, by the Department, who reserves the right to accept or reject the proposal wholly or in part. The Sub-vendor/ Sub-contractor directory (revised if applicable) shall be incorporated in the Contract.

Upon award of the Contract, the Contractor shall submit the list of Sub-vendors/ Sub-contractors selected from the directories given in the Contract with whom the Contractor has finalized to source the materials/ services. In case the Contractor proposes sourcing the materials/ services from Sub-vendors/ Sub-contractors not covered in the directories given in the Contract, the list of such Sub-vendors/ Sub-contractors, along with their detailed company profile, shall be submitted. The list of additional Sub-vendors/ Sub-contractors proposed by the Contractor is subject to review by the Department, who reserves the right to accept or reject the proposal wholly or in part.

Nevertheless, the Department's proposal or approval of Sub-vendor/ Sub-contractor shall not absolve the Contractor of their responsibility to comply with the specification/ obligation of the Contract.

1.5.5.2. Sub-Contracting

The Contractor shall not assign or sub-contract the work or any part of the work without the written approval of the Department. In the event of approval of Sub-contractors, the detailed specifications and drawings of sub-contracted items shall be approved by the Department. All the works carried out by such Sub-contractors shall also be scrutinized, inspected and approved by the Department. However, the responsibility for the performance of such sub-contracted systems shall lie with the Contractor. Any delay in carrying out the work by the Sub-contractor which affects the overall execution schedule does not absolve the Contractor from payment of compensation for the delays. All terms and conditions applicable to the Contractor shall also be applicable to the Sub-contractor who has been assigned the sub-systems.

1.5.6. Inspection

1.5.6.1. Primary Inspection by Third Party Inspection Agency

All the materials purchased by the Contractor shall be inspected by the Third Party Inspection (TPI) agency. It shall be the Contractor's responsibility to arrange & co-ordinate with the TPI agency. The charges for inspection by the TPI agency shall be included in the basic cost of the material.

The primary TPI agency responsible for inspection of the systems/ sub-systems/ components/ materials/ services shall be chosen from among the following list:

- a. Lloyds Register Industrial Services Pvt Ltd (LRIS)
- b. Det-Norske Veritas (DNV)
- c. Technischer Überwachungs Verein (TUV)

In the event of unavailability of any of the aforesaid TPI agencies in a particular location, the Department may, at their own discretion on case-to-case basis,



permit engaging alternative TPI agency based on proposal from the Contractor along with the agency's credential.

The TPI agency shall be responsible for

- Inspection of the bought-out materials at the Sub-vendor's premise and
- Material-receipt (inward), in-process (stage) & pre-delivery (final) inspection during manufacture/ fabrication at the Contractors'/ Sub-contractor's/ Sub-vendor's premises.
- Witnessing of hydrostatic test and leak test.
- Issue of inspection report and release note
- Stamping of all items

QAP given in Volume 2 of this RFP document is only provisional and it is the responsibility of the Contractor to prepare Quality Assurance Plan (QAP) for all the systems/ subsystems/ components/ materials giving the detailed scope of inspection and submit to the Department for approval.

1.5.6.2. Surveillance Inspection by Department

Notwithstanding the inspection by TPI agency, the Department, at their own discretion and on surveillance basis, shall have the right to depute their representative(s) to perform material-receipt/ in-process/ final pre-delivery inspection at any phase during fabrication/ manufacture of any system/ subsystem/ component/ material at the Contractor's/ Sub-contractor's/ Sub-vendor's premise, for ascertaining the material and workmanship of the system. The Contractor shall obtain the necessary permission for the Department's representatives to visit the Sub-contractor's/ Sub-vendor's premise. For the inspection by the Department's representatives, the Contractor/ Sub-contractor/ Sub-vendor shall provide, at their premise, free of charge, assistance, labor, materials, electricity, instruments, etc. as may be reasonably needed.

The participation and approval by the Department's representatives during the inspection/ review shall not absolve the Contractor of their responsibility to comply with the specification/ obligation of the Contract.

1.5.6.3. Site Inspection by Department:

Department shall carryout all the inspection related to the fabrication, installation, testing, commissioning and acceptance of Water based Fire Protection System carried out at the Site. It is the responsibility of the Contractor to coordinate with the department's representative for carrying out the necessary inspections at the Site.



1.5.7. **Delivery**

1.5.7.1. **Packing**

All the equipment, flow components, pipes, pipe fittings, instruments, etc. shall be blanked off at ends by dust-tight plugs/ closures. The materials shall be packed and crated for delivery by sea/ air / road in a manner suitable for safe transportation to Mahendragiri, which has tropical humid climate, in accordance with internationally accepted practices and in such a manner as to protect them from damage and deterioration during the transportation. The Contractor shall be held responsible for all damages due to improper or inadequate packing. The packing specification shall be mutually agreed upon in advance before delivery.

Phytosanitary certificate: As per “Plant Quarantine (Regulation of Control into India) Order”, articles packed with packaging material of plant origin viz. hay, straw, wood shavings, wood chips, saw dust, wood waste, wooden pallets, dunnage mats, wooden packages, coir pith, peat or sphagnum moss, etc. will be allowed entry by Customs (Department of India) only with a “Phytosanitary certificate”. Therefore, the Contractor shall ensure that any imported consignment is accompanied by such a certificate issued by the Plant Quarantine authority in the country of origin, if any of the above-mentioned packaging materials is used. In case of delay/ denial in customs clearance (in India), the entire responsibility including additional expenditure shall solely rest with the Contractor.

1.5.7.2. **Delivery Term**

All the materials under the Contract shall be delivered on “F.O.R/MAHENDRAGIRI”

The ultimate consignee shall be as follows:

Purchase & Stores Officer, Stores Section,
ISRO Propulsion complex,
Indian Space research Organization,
Department of Space, Government of India,
Mahendragiri 627133,
Tirunelveli District, Tamil Nadu State,
India.

Marking: The Contractor shall ensure that the consignments are legibly and properly marked with Contract Number, Destination and other details for correct identification. One copy of the packing list giving details such as dimensions, gross mass, net mass, content of each package, etc. shall be enclosed in each



package. The Contractor shall be liable for any additional expense or demurrage due to improper identification.

The Contractor shall email the complete delivery documents immediately upon dispatch.

1.5.7.3. Custom Clearance

The Department will provide CDEC for imported materials as per Section 1.5.3.2.5 to avail concessional rates of duties. The Contractor shall be responsible for custom clearance, payment of duties as may be applicable and transportation of the consignment from seaport/ airport in India to the Department's site.

1.5.7.4. Transportation:

All the material shall be delivered at Site by Contractor at his own risk.

1.5.7.5. Storage and Handling

Upon receipt of the consignment, the Contractor shall unload and store the materials at the Department's site. It shall be the Contractor's responsibility to construct temporary sheds/ buildings for proper storage of the materials to protect them from the vagaries of nature. The Contractor shall be responsible for safe and secure custody of the materials until final acceptance of Fire Protection Systems established at SIET.

1.5.8. Insurance

The Contractor shall provide, at their own expense, the following insurances from a nationalized/ Government insurance company and endorse the policies in favor of the Department. The Contractor shall seamlessly revalidate the policies until final acceptance of Fire Protection Systems established at SIET with additional claim period of 2 (Two) months:

1.5.8.1. During onsite activities at the Department's premise, the Contractor shall provide the following insurances:

- a. Workmen compensation policy (Personnel insurance) for the Contractor's/ Sub-contractor's personnel under all categories covering death, accident and invalidity
- b. Third-party business liability insurance to cover damage caused by fault of the Contractor to the Department and/ or third parties. The liability shall be Rs. 20 Lakh for bodily injury applicable to each person and Rs. 1 Crore for tangible assets. The Department shall indemnify the Contractor against any further claims.



c. Storage-cum-erection all-risk insurance for all the materials/ equipment supplied for their full value to cover physical loss or damage occurring until final acceptance of Fire Protection Systems established at SIET.

1.5.8.2. Notwithstanding the aforesaid insurance, the Contractor shall be responsible for all the materials/ services including all losses & uninsured losses until final acceptance of Fire Protection Systems established at SIET.

1.5.9. **Compliance with Standard**

All the materials supplied or used shall be new and of first quality and manufactured and tested in accordance with the latest editions of the relevant Indian/ International standards. Wherever imported components are used, they shall be manufactured in accordance with the relevant standards published in the country of manufacture after allowing for specific aspects under Indian conditions such as tropical climate, etc. Any material or work, where no specific standard is applicable, shall be fabricated as per the instructions and directions of the Department.

All the electrical equipment used shall conform to the latest Indian Electricity Rules/ international standards as regards safety, earthing and other essential provisions specified therein for installation and operation of electrical parts.

1.5.10. **System Performance**

The Contractor shall ensure performance of the system comprising all equipment, materials, services, etc. delivered/ executed by them under this Contract in strict compliance with the specification and term & condition. The Contractor shall successfully demonstrate the performance during commissioning. If the Contractor is unable to demonstrate the performance as per the specification, within the stipulated period, and if the results deviate from the specification, the Contractor shall correct them at no extra cost for the Department and repeat the test within a reasonable period of time as agreed to by the Department. The Contractor shall make effort practicable to correct/repair the deficiencies. However, the Department reserves the option to reject the ill-performing equipment/ systems and when this option is exercised by the Department, the Contractor shall replace the rejected equipment/ systems by new ones at their own cost to the Department's satisfaction within a reasonable period of time as indicated by the Department.

On the other hand, if the Department accepts the system, though it fails to comply with the specification fully, the Department will, at their own discretion, make necessary recoveries for such shortfall in performance.

In the event of rejection, in order to minimize the consequential losses, the faulty equipment shall be retained until a new replacement arrives at site for



erection. It should be noted that as the faulty equipment has not been accepted and not taken over by the Department, the responsibility for it lies entirely with the Contractor. During this period, the Contractor shall not limit the use of faulty equipment except for reasons of safety during operation both for personnel and equipment.

1.5.11. **Warranty**

The Contractor shall warrant that the Fire Protection Systems established at SIET comprising all equipment, materials, services, etc. delivered/ executed by them under this Contract are free from any defect resulting from faulty design, material or workmanship for a period of 12 (Twelve) months from the date of final acceptance of Fire Protection Systems established at SIET.

1.5.11.1. **Defect Liability**

In case any defect, except due to normal wear & tear or faulty operation, develops in the system due to bad materials and/ or bad workmanship during the warranty period, the Contractor, upon notification by the Department, shall rectify or remedy the defects at their own cost and make their own arrangements to provide material, labor, equipment and any other appliance required in this regard. The equipment or component repaired or replaced by the Contractor shall be warranted for an extended period of 12 (Twelve) months from the date of such repair or replacement. However, such extended warranty shall not exceed 12 (Twelve) months from the date of expiry of the original warranty period. It is Contractor's responsibility to transport the defective equipment/ system from Department's site to suitable factory and back to the Department's site after rectification of the defect.

Latent Defect: Even after expiry of the warranty period, the Contractor shall remain liable for latent defects in the system for a period of 12 (Twelve) months from the date of expiry of the warranty period. Latent defect means a defect in material or workmanship which unravels during such period but existed upon delivery itself and could not have been discovered. The Department is responsible to prove, by a third party mutually agreed by the Parties, that the failure of the system is due to latent defect.

1.5.11.2. **Performance Bank Guarantee**

The Contractor shall furnish a Performance Bank Guarantee (PBG) from a nationalized/ scheduled bank approved by RBI or a reputed first-class international bank for 10% of the total Contract price valid till expiry of the warranty period with additional claim period of 2 (Two) months. If any defect in the system executed by the Contractor is noticed by the Department during the warranty period and Contractor fails to rectify or remedy the defects, the Department will have the right to get this done by other agencies and recover



the cost incurred, as determined by the Department, which shall be final and binding, by enforcing the PBG.

1.5.12. Documentation

- 1.5.12.1. The Contractor shall submit the relevant documents during different phases of the Contract. The documents are subject to review by the Department. However, the Department's approval shall not absolve the Contractor of their responsibility to comply with the specifications and obligations of the Contract.
- 1.5.12.2. All the documents shall be provided in English language only. In the event that the documents by the Sub-contractors/ Sub-vendors are in some other language, it shall be the Contractor's responsibility to translate them to English language.
- 1.5.12.3. The documents shall be provided in one copy hard print and in electronic form (softcopy) in CD-ROM or DVD-ROM.
- 1.5.12.4. Master Documentation: During final acceptance of Fire Protection Systems established at SIET, the Contractor shall provide a consolidated repository of the latest versions/ revisions of all the documents generated/ used during the course of entire contract execution. The documents shall be in electronic form on a common platform from which any document shall be retrievable through user-friendly front-end interface software. The platform and software shall be compatible for installing in any computer or server of the Department.

The Master documentation shall be exhaustive covering, but not limited to, Contract & amendment(if any), FEED review report, detail engineering documents& review reports, purchase orders, general arrangement drawings of equipment, flow components& instruments, pre-delivery inspection & test documents, invoices, manufacturer's instruction manuals for installation, operation, maintenance & trouble-shooting, guarantee/ warranty certificates, construction/ erection test & inspection documents, commissioning reports, execution report, standard operating procedures, final acceptance certificate, minutes of meetings, schedule charts, payment reconciliation statement, inventory of spares with proper identification number correlating to their location in the appropriate place, etc.

- 1.5.12.5. Phase Wise Document Submission: Contractor shall submit the relevant documents during different phases of the Contract for department review and approval.

a. Design review phase

Contractor shall submit a document listing their comments on the design document provided by the Department. If the Contractor proposes any alternative scheme or sizing, the detailed justification, along with calculation



wherever necessary, shall be submitted. In case the Contractor proposes to employ alternative codes/standards followed which are different from those specified in this document, the copies of such codes/ standards in English shall be submitted.

b. Detail engineering review phase

Contractor shall submit Detail Engineering Review document and the level of information to be provided in the document is given in Section 2.4.2 of Volume 2 of this RFP document.

1. Pipeline layout drawings
2. Pipeline isometric drawings
3. Design calculations of each fire protection systems
4. Sizing calculation and estimation of pressure drop
5. Sizing calculations of Water Spray nozzles and modeling output
6. Design calculation and analysis of water hammer effect
7. Design calculation of foundations and its load details
8. Design calculation of structural supports, elevated platforms etc.
9. Power earthing scheme
10. Purchase specification of materials and associated drawings
11. List of essential spares to be supplied
12. Quality Assurance Plan for individual materials and fabrication of pipelines.
13. List of sub-vendors/ sub-contractors
14. Execution Plan and procedure for fabrication, installation, testing and commissioning
15. Safety Assurance Plan for site execution.

After Detail Engineering Review, all the documents shall be updated accordingly and submitted to Department for approval.

c. Material pre-shipment phase

Contractor shall submit the following documents for the items given in Section 2.5 of Volume 2 of this RFP document.

1. As-built fabrication drawings and GA drawings
2. Test certificates and inspection reports of the materials such as equipment, flow components, pipes, pipe fittings, structural steel materials, fasteners, instruments (including calibration certificates), etc.
3. Test certificates and inspection reports of fabrication (including the radiographic films).
4. Pre-Delivery Inspection (PDI) report by TPI agency

Department shall review the documents and provide dispatch clearance. Material shall be dispatched to Department's site based on this.



d. Fabrication, installation and testing phase

Contractor shall submit the following documents at the end of the installation activity.

1. As-built pipeline layout drawings
2. As-built pipeline isometric drawings
3. Estimation of pressure drop based on the as-built pipeline isometric drawings
4. Record of Certificates (including radiographic films) done during erection
5. Consolidated Inspection reports jointly performed by Contractor and Department (SRG).

e. Commissioning phase

Contractor shall submit the following documents at the end of the commissioning activity.

1. Standard Operating Procedures of each system
2. Record of test Certificates done during commissioning
3. Consolidated Inspection reports jointly performed by Contractor and Department (SRG).
4. Final acceptance report (jointly between the Department and the Contractor).

1.5.13. **Confidentiality**

- 1.5.13.1. The technical information, drawings, specification and other related documents forming part of the RFP or Contract are property of the Department and shall not be used for any other purpose except for execution of the Contract. All rights, including the rights in the event of grant of a patent and registration of designs, are reserved.
- 1.5.13.2. The Contractor shall undertake to deem confidential any information related to the Contract or submitted under its conditions and to use such information only for the purpose of the Contract and also shall not allow any disclosure of the information therein.
- 1.5.13.3. The technical information, drawings, specifications, records and other documents shall not be copied, transcribed, traced or reproduced in any other form or otherwise in whole and/ or duplicated, modified, divulged and/ or disclosed to any third party and not misused in any other form whatsoever by the Contractor without the Department's consent in writing, except to the extent, required for the execution of this Contract. In this case, the third party shall undertake in advance the obligations and restrictions set forth above.



- 1.5.13.4. The Contractor shall undertake not to issue any communiqué concerning the contents of the Project without obtaining prior written consent from the Department.
- 1.5.13.5. The Contractor shall get written obligation on maintaining the confidentiality from their Sub-contractors.
- 1.5.13.6. In the event of violation of the conditions of confidentiality, the Contractor shall be liable to take all actions, in accordance with the laws of India, for settlement of dispute with the third party and shall bear all losses and expenses, arising in connection with the aforesaid settlement.
- 1.5.13.7. This confidentiality clause shall not apply to the information which may be mandated to be disclosed by law or at the request of the either Party's Government agency.
- 1.5.13.8. This confidentiality clause shall not apply to the technical information, drawings, specifications and other related documents delivered by Contractor under the Contract, which shall be treated as property of the Department.
- 1.5.13.9. The Contractor shall classify the technical information such as reference documents, design results, software codes & program which are proprietary in nature while sharing with Department during Detail engineering. The confidentiality clause shall be applicable to the Department for such documents mutually agreed upon between the Department and the Contractor.

1.5.14. **Indemnity against Infringement of Regulation**

The Contractor shall indemnify the Department against infringement of the following regulations:

1.5.14.1. **Labor Law**

The Contractor shall indemnify the Department against any action, claim or proceeding relating to infringement of all or any of the prevailing labor laws of India like Workmen's Compensation Act 1923, Contract Labor (Regulation and Abolition) Central Rules 1971, Industrial Disputes Act 1947, Employees Provident Funds and Miscellaneous Act 1952 during the onsite activities at the Department's premise.

1.5.14.2. **Patent Right**

The Contractor shall fully indemnify the Department against any action, claim or proceeding relating to infringements or use of any patent or design or any alleged patent or design rights and shall pay any royalty which may be payable in respect of any claim made under or any action brought against the Department. In respect of such matters as aforesaid, the Contractor shall be set



at liberty, at their own expense, to settle any dispute or to conduct any litigation that may arise there-from. The Contractor shall not be liable to indemnify the Department on the infringement of the patent or design or any alleged patent or design right which is the direct result of an order passed by the Department.

1.5.15. Settlement of Dispute

The Parties shall carry out their respective obligations under the Contract in the spirit of mutual cooperation, good faith & harmony. Except in matters in respect of which the decision of the Department is final as specified in the Contract, any difference, dispute or controversy shall be resolved and settled amicably among the Parties. If, however, that is not possible, the Parties shall agree that all disputes arising out of or in connection with the Contract shall be finally and conclusively decided by arbitration and the award in pursuance thereof shall be binding on the Parties.

1.5.15.1. Arbitration

If, at any time, any question, dispute or difference whatsoever shall arise between the Department and the Contractor upon or in connection with this Contract, either Party may forthwith give to the other notice in writing of the existence of such question, dispute or difference and the same shall be referred to the adjudication of arbitrators. The arbitration shall be in accordance with the rules of the Indian Arbitration and Conciliation Act, 1996 as amended from time to time. The court of arbitration shall base its decision on this Contract with resort to Indian law. The arbitration shall take place in India. The language shall be English. Work under the Contract shall, if reasonably possible, continue during arbitration proceedings.

1.5.16. Jurisdiction and Applicable Law

The Contract shall be governed by the laws of India for the time being in force. Subject to the Arbitration clause, the Courts in whose territorial jurisdiction the Department's premise is located shall be competent to deal with and decide any legal matter or dispute arising out of the Contract.

1.5.17. Language and Measure

All the documents pertaining to the Contract including specifications, design document, detail-engineering documents, test certificates, inspection reports, correspondences, operation & maintenance manuals or any other writing shall be written in English language only. The SI units (*Système International d'Unites*) of measurement are used exclusively in the RFP/ Contract and shall be used in all future documents connected with the Contract. All the pressure values are in gauge scale, unless specifically suffixed by "(a)" which indicates absolute.



1.5.18. **Limitation of Liability**

The warranties, representations, obligations and liabilities of the Contractor for non-performance/ breach as set forth herein are exclusive and in substitution of any other warranties, conditions, representations, obligations and liabilities, express or implied, arising by law or otherwise. The total cumulative and aggregate liability of Contractor in connection with the Contract including LD and damage to the property of the Department shall not exceed 20 % of the total Contract price excepting, however, Contractor's cost of completing his scope of delivery, rectification work or repairs or replacements as well as any amounts recovered under Contractor's insurance. Notwithstanding anything contained in the Contract, in no event shall the Contractor be liable to the Department by way of indemnity or by reason of negligence or breach of the Contract or in tort or otherwise for loss of production or products, loss of profits, damages or losses claimed by third parties, loss of use, loss of Contracts, increased cost of operation, maintenance or staffing needs, any other financial or economic loss or any indirect, incidental, special punitive or consequential damages of any description and howsoever arising in connection with the Contract.



1.6. **CONTRACTOR's FUNCTION**

1.6.1. **Execution of Work**

- 1.6.1.1. The specification of the Contract is intended to describe and provide for a complete finished system. The Contractor shall agree and understand that the work to be executed shall be complete in every detail, even though every item necessarily involved is not particularly mentioned in the RFP/ Contract document. The Contractor shall be required to provide all labor, materials and equipment necessary for completion of the work described and shall not avail themselves of any manifesting unintentional error, omission or inconsistency that may exist. The Contractor shall carry out and complete the work in every respect in accordance with the Contract and the directions and to the satisfaction of the Department.
- 1.6.1.2. The Contractor shall provide everything necessary for the proper execution of the work according to the intent and meaning of the specification whether the same may or may not be particularly shown or described therein, provided that the same can reasonably be inferred there-from and if the Contractor finds any discrepancy there-in, they shall immediately and in writing refer the same to the Department whose decision shall be final and binding on the Contractors.
- 1.6.1.3. If any part of the Contractor's work depends for proper execution upon the work of any other contractor, the Contractor shall inspect and promptly report in writing the Department any defect in such work of the other contractor that tender it unsuitable for proper execution of the work under the Contract. Their failure to so inspect and report shall constitute acceptance of the other contractor's work as fit and proper for the reception of their work, except as to defects which may develop in the work of the other contractors after proper execution of the work. To ensure proper execution of their subsequent work, the Contractor shall measure the work already in place and shall at once report to the Department any discrepancy between the executed work and the drawings.
- 1.6.1.4. The Contractors shall not sell, assign, mortgage, hypothecate or remove equipment or materials which have been erected or which may be necessary for the completion of the Contract without the written consent of the Department.
- 1.6.1.5. In the execution of the work, no person other than the Contractor or their duly appointed representatives, their Sub-contractor and their workmen, shall be allowed to do work at the site except by the special permission in writing by the Department.
- 1.6.1.6. The Contractor shall proceed with the work to be performed under the Contract and each & every part & detail thereof in the best and most workmen-like manner by engaging qualified, careful and efficient workers and do the several parts thereof at such time and in such order as the Department directs and



finish such work in strict conformance with the plans, drawings and/ or specifications and any change, modification or amplification thereof made by the Department.

- 1.6.1.7. The personnel of the Contractor and their Sub-contractor shall follow the safety, security and administrative norms of the Department at site.

1.6.2. **Supply of Tools, Tackles and Other Materials**

- 1.6.2.1. For completion of the work, the Contractor shall, at their own expense, furnish all necessary false work, erection tools, machine tools, power tools, tackles, hoists, cranes, derricks, cables, slings, skids, scaffolding, work benches, tools for rigging, cribbing and blocking, welding machines, pre-heating and stress relieving equipment, X-ray and all associated protective equipment, appliances, materials and supplies required to accomplish the work under the Contract unless otherwise provided for. Adequacy of such tools shall be subject to final determination of the Department.

- 1.6.2.2. The Contractor shall also furnish all necessary expendable devices like anchors, grinding and abrasive wheels, plugs, hacksaw blades, taps, dies, drills, reamers, chisels, files, carborundum stones, oil stones, wire brushes, necessary scaffolding, ladders, wooden planks, timbers, sleepers, and consumable materials like oxygen, acetylene, argon, lubricating oils, greases, cleaning fluids, cylinder oil, graphite powder and flakes, fasteners, gaskets, temporary supports, stainless steel shims or various thicknesses as required, cotton waste, PTFE tapes and all other miscellaneous supplies of every kind required for carrying out the work under the Contract.

- 1.6.2.3. The Contractors shall not dispose, transport or withdraw any tools, tackles, equipment and materials provided by them for the Contract without taking prior written approval from the Department and the Department at all times shall have right to refuse permission for disposal, transport or withdrawal of tools, tackles, equipment and material if, in their opinion, the same will adversely affect the efficient and prompt execution of the work.

1.6.3. **Protection of Work**

- 1.6.3.1. The Department will not be responsible or held liable for any damage to person or property consequent upon the use, misuse or failure of any construction/ fabrication tools and equipment used by the Contractor or any of their Subcontractor even though such construction tools and equipment may be furnished rented or loaned to the Contractor or any of their Sub-contractor. The acceptance and/ or use of any such construction tool and equipment by the Contractor or their Sub-contractor shall be construed to mean that Contractor accept all responsibilities and agree to indemnify and save harmless the



Department from any and all claims for said damages resulting from said use, misuse or failure of such construction tool and equipment.

- 1.6.3.2. The Contractor and their Sub-contractor shall be responsible during work for protection of the work which has been completed by the other contractors. The necessary care shall be taken to see that no damage to the same is caused by their own personnel during the course of execution of their work.
- 1.6.3.3. All other work completed or in progress as well as machinery and equipment that are liable to be damaged by the Contractor's work shall be protected by the Contractor and such protection shall remain and be maintained until its removal is directed by the Department.
- 1.6.3.4. The Contractor shall effectively protect all the works from action of weather and from damages or defacement and shall cover finished parts where required for their thorough protection.

1.6.4. **Coordination with Other Contractors and Interfacing of Work**

The Contractor shall extend full cooperation to other contractors of the Department to perform their works at site simultaneously. The Contractor shall so arrange their schedule of activities as to ensure smooth and timely execution of the Contract, minimize interference with the works of the other contractors and allow the other contractors the use of the facilities put up by them for erection activities. For this purpose, the Contractor shall plan such works and indicate such interfaces in an interface schedule. They shall not be entitled to any extra payment on this account. The Department will not entertain any claim from the Contractor for delay on account of lack of coordination with the other contractors.

1.6.5. **Site Personnel**

- 1.6.5.1. The Contractor shall identify a Resident Construction Manager, a Resident Quality Engineer and a Resident Safety Officer. The names of identified persons shall be communicated in writing to the Department and approved by the Department to supervise the work under the Contract.
- 1.6.5.2. The RCM shall have full technical capability and complete administrative & financial powers to expeditiously & efficiently execute the work under the Contract. Any written order or instruction which the Department may give to the Contractor's RCM or his/ her representative shall be deemed to have been given to the Contractor.
- 1.6.5.3. Resident Site Engineer shall be responsible for execution of work within the schedule by following safety procedures and quality assurance plan. He should be competent to execute the work as per the drawings and site requirement.



- 1.6.5.4. Resident Quality Engineer shall be responsible for overall quality monitoring at site for coordination with the Department and inspection agencies to enable them to carry out quality-related inspection works in a satisfactory manner.
- 1.6.5.5. Resident Safety Officer shall be responsible for ensuring safe working environment at the construction site. He shall have good communication skill and should be able to speak English, local language or the language spoken by the majority of workers.
- 1.6.5.6. The Contractor's site personnel shall maintain an office on or adjacent to the site of work and shall at all times keep in the said office a complete set of specifications and drawings. The Department will normally communicate directly with the Contractor's RCM at site.

1.6.6. **Employment of Laborer**

The Contractor shall employ, on the work, only their regular skilled employees with experience of this particular work as far as possible. No female laborer shall be employed after normal working hours. No person below 18 (Eighteen) years of age shall be employed. Work Labor (Regulation and Abolition Act), Central Rules 1971 shall be followed while deploying the laborers.

The Contractor shall pay to each person, wages not less than those specified by Minimum Wages Act. The employees/ laborers for carrying out all the site works shall be identified well in advance by the Contractor and necessary approval shall be obtained from the Department for entry to the work site.

1.6.7. **Reporting**

The Contractor shall report the following information to the Department by the end of every week during the work at Department's site:

- a. Number of personnel employed, by trades
- b. Progress achieved
- c. Expected dates for completion of individual works
- d. Any actual or likely delay in the execution of work

The Contractor shall also prepare the minutes of onsite progress review meetings and get them duly approved by the leaders of the respective Parties.



1.7. **SITE ACCESS AND SECURITY PROCEDURES**

Contractor shall adhere and observe all security procedures of Department.

1.7.1. **Site Entry Permit – Personnel and Machinery**

- a. Contractor shall arrange to apply for and secure valid gate passes for the entry and exit of his men, materials and equipment, including those of the sub-contractors, from the concerned authorities of the Department.
- b. The contractor shall ensure that their workmen and supervisors shall not move to other places other than their work premises without proper permission / authorisation.
- c. The contractor shall ensure verification of antecedents of the labourers/ supervisors from Polices/ other officials before they are engaged by him. No person having adverse antecedent shall be employed by the contractor. The contractor shall be held responsible for all the acts carried out by his workmen.
- d. Access to the Department's site must be at all times via recognized roadways and footpaths. Anyone found disregarding this rule would be subject to disciplinary action.
- e. Contractor must obtain work permit prior to the commencement of work. Contractor shall obtain permission from Department for taking flammable materials such as Diesel/ Kerosene, gas cylinders such as Oxygen, LPG/DA into department's site.

1.7.2. **Gate Pass**

- a. The Contractor shall make his own arrangements of Gate Pass for his employees as prescribed and instructed by the Security dept. i.e. CISF, and each gate pass has to be endorsed by the Security Officer.
- b. In case of termination of the service of any of his employee during the contractual period, the contractor shall surrender the Gate Pass issued to the employees to the Security department. At the end of the project all the gate passes endorsed by the Security department. for use of the contractor's employees shall be returned.
- c. Separate entry passes shall be issued for visitors. Visitor passes will be valid only for a day (Normal working hours).

1.7.3. **Working During Holidays and After Office Hours**

- a. Contractor shall obtain necessary permission from Department to work after office hours and holidays.
- b. Contractor shall assign responsible person as in-charge and it shall be informed to Department.



- c. Contractor shall arrange sufficient lighting, emergency vehicle and emergency DG for working after office hours.

1.7.4. **Prohibited Items and Activities**

- a. Use of mobile phone, camera, smoking, matchbox, lighter and any other source of ignition are prohibited inside the Department's premise.
- b. Gambling, fooling on the work, horseplay, mock fighting or fighting is forbidden in the Department's site.
- c. Entering the Department's site while in possession of weapons such as knives & gun etc. is prohibited.
- d. Contractor personnel shall not pick up quarrel or get into arguments with Department's personnel or act in any misunderstanding, such problems should be referred to appropriate Department's personnel.
- e. Entering and working under influence of alcohol/ narcotics at Department's site is forbidden.



1.8. **WELFARE FACILITIES**

Contractor shall provide all welfare facilities to their employees. The Department will provide at site, free of cost, space for construction labor rest rooms, etc. at designated locations and the Contractor shall install them at their own cost.

1.8.1. **First Aid**

The Contractor shall make their own medical and transport arrangements to take care of their employees in case of accident. Contractor shall arrange a standby vehicle for this purpose. The Contractor shall provide a first aid kit at the work site to meet the requirements of minor injuries. However, the Contractor may have access to the Department's advanced first aid centre and ambulance in case of accident, subject to availability of the same.

1.8.2. **Sanitation And Hygiene Measures**

Contractor shall take all necessary precautions to prevent mosquito breeding and prevent from snake bite.



1.9. **SAFETY REQUIREMENTS AND REGULATIONS**

The safety requirement set forth is the minimum requirements that shall be implemented by the Contractor during the project execution. The Contractor shall observe all statutory and legal requirements enforced by Central and State Governments applicable to the work.

1.9.1. **General Safety Rules**

1. Use of Personal Protective Equipment (PPE) is mandatory and the Contractor shall provide all necessary PPE to their workmen and ensure compliances of wearing necessary PPE inside worksite.
2. Contractor shall ensure that all his workmen are aware about the nature of risk involved in their work and have adequate awareness and training for carrying out their work safely.
3. Contractor shall carryout any work having supervisor at site. If it is required to work simultaneously in more than one location, one supervisor must be put in each of the locations.
4. Contractor shall ensure high standard of housekeeping in the worksite. The materials shall be stacked/ positioned properly and the work area shall be cleaned thoroughly on daily basis.
5. Contractor shall obtain permit to work and electrical safety permit from Department prior to commencement of work.
6. Contractor shall plan his operations so as to avoid interference with the other contractors at the site. In case of any interference, necessary coordination shall be sought by the contractor from the Department for safe and smooth working.
7. Contractor shall report all accidents, near miss to the Department.
8. Contractor shall take all precautionary measure for fire prevention including providing fire extinguishers and fire blankets while performing hot works such as welding, gas cutting and grinding activity.
9. Contractor shall route all electrical connections through ELCB. Cables shall be of appropriate rating and free from damage.
10. Contractor shall use scaffolds for working at height and it shall have toe guard, mid rail, hand rail, working platform and the access to the scaffold shall be through suitable ladder.
11. Contractor shall provide double lanyard full body harness and shall ensure that the workmen always anchor the lanyard while working at height.
12. Contractor shall only put the tools, tackles, material handling equipment in site that is good in condition and sound to use.

13. Contractor shall provide proper shoring, slope for excavation and shall dump the earth away from the excavated area.
14. Contractor shall provide barricades and safety sign appropriately.
15. The contractor shall be held responsible for non-compliance of any of the safety measures and delays, implications, injuries, fatalities and compensation arising out of such situations or incidents.

1.9.2. **Safety Assurance Plan**

Contractor shall prepare and submit their Safety Assurance Plan for its implementation during site execution of Establishment of Water Based Fire Protection Systems at SIET. The following aspects and the minimum safety requirements set by Department shall be covered in Safety Assurance Plan.

1. Contractor's Safety Policy	2. Contractor's Personnel Roles and Responsibilities towards site safety
3. Safety Trainings and Awareness Programs	4. Job Safety Analysis
5. Safety Inspections	6. Accident Reporting and Investigation
7. Site Emergency Action Plan	8. Work Permit System
9. Personal Protective Equipment (PPE)	10. Housekeeping
11. Safety Signs	12. Electrical Safety
13. Form Work	14. Excavations
15. Hot Work	16. Fire Prevention and Control
17. Compressed Gases and Combustible Liquids	18. Material Handling (Rigging)
19. Working at height	20. Radiography
21. Hand Tools and Power Tools	22. Temporary Structure/Fixtures

1.9.3. **Site Safety Organisation**

Contractor shall post a qualified and experienced 'Safety Officer' and deploy Safety Supervisors and observers in every shift, to exclusively oversee and ensure compliance with all applicable safety requirements. Contractor shall notify the name of the Safety Officer and other safety personnel along with their bio-data to the Department for the approval. Only on approval by Department these personnel are authorised to work.

Qualifications of Safety Officer shall not be less than as prescribed in local regulations.



1.9.4. **Pro-Active Safety Monitoring**

Contractor shall implement proactive safety monitoring programs that provides feedback for continuous improvement in safety performance and ensure compliances.

1.9.4.1. **Safety Inspections**

Contractor shall identify the list of activities, operations, machineries, tools, lifting gears, equipment and carryout safety inspections to ensure the inspected system is in accordance to a general set of safety rules.

Contractor shall formulate the required checklist for all activities and equipment. The inspections shall be job specific, routine inspection or walk-around inspection.

In addition, Department shall conduct safety inspections at the site and any non-compliance shall be complied by the Contractor and compliance report shall be sent to Department.

1.9.4.2. **Safety Audit**

Department shall conduct safety audit at Contractor's worksite to evaluate and assess the effectiveness of the implementation of site safety plan at workplace.

Department shall decide the periodicity and frequency of safety audit and prior intimation shall be provided to Contractor for conducting the safety audit.

Contractor's RCM holds the ultimate responsibility in ensuring implementation of safety audit recommendations during the project phase.

1.9.4.3. **Job Safety Analysis (JSA)**

Contractor shall carryout JSA for all the activities that are carried out at the site. JSA is a tool to identify and mitigate the hazard. JSA shall be jointly prepared by Contractor's Site Engineer and Contractor's Safety Officer. JSA shall be disseminated among the crew involved for the particular task before its commencement.

Contractor's Site Engineer is responsible to ensure that all resources (equipment, tools, materials etc) identified through JSA are implemented and all the steps identified to prevent the hazards are implemented while executing the job.

1.9.5. **Safety Training and Awareness Programs**

Contractor shall provide adequate information on safe working practices and create awareness among the employees. He shall ensure that his employees



are adequately trained and experienced to carry out their work safely. Contractor shall maintain records of all the activities and shall submit to Department for periodical verification.

1.9.5.1. Safety Induction

Contractor shall prepare a training module on site safety induction and shall submit to Department for review. Based on the department's consent, it shall be used for conducting safety induction.

Contractor shall conduct safety induction for all employees before engaging them at site. Safety induction card duly stamped as "Safety Inducted" and the date of induction by contractor shall be issued after the completion of Induction.

1.9.5.2. Toolbox Talk

Contractor shall conduct job specific toolbox talk and weekly toolbox talk to encourage two way communications with the employees.

Contractor's Site Engineer/ Supervisor shall conduct job specific toolbox talks (JSA) for all workers before commencement of their job. Topics shall include hazards and safety precautions as identified in the JSA.

Contractor's Safety Officer shall conduct weekly tool box talk preferably on Monday at the start of the shift. Topic shall include the list of safety violations observed in the previous week and the safe practices to be followed to mitigate the hazards.

1.9.5.3. Safety Training and Mock Drill

Contractor shall organize safety training programs to create awareness among their employees. This shall be in the form of classroom training or on-field demonstration also. Contractor shall conduct safety training on monthly basis till completion of Project. Mock drill shall be conducted on quarterly basis on various emergency situations.

In addition, Department shall also conduct Safety Training Programs and Contractor shall permit their personnel to participate in such programs.

1.9.5.4. Safety Posters and Safety Signs

The contractor shall take every effort to communicate the safety measures through displaying posters, banners and sign boards around the work site. Contractor shall replace posters at least once in a month to maintain its effectiveness



1.9.5.5. Safety Competitions, Awards and Recognition

Contractors may plan for various safety competitions to motivate employees to take active part in safety program. Contractor shall formulate and institute safety award program for individual's safety performance excellence with focus on remarkable achievements and contributions towards safety.

1.9.6. Incident Reporting

Contractor shall immediately report verbally about any incident at occurred at site, how slight they are or which entail a person reporting to hospital or leaving site for treatment to department. This will enable the Department to reach to the scene of incident / dangerous occurrences to monitor/assist any rescue work and/or start conducting the investigation process.

Contractor shall submit the written reports of all incidents and dangerous occurrences within 12 hours of its occurrence.

Contractor shall promptly report the return date of injured person for duty to Department.

Contractor shall display incident reporting chain and emergency contact numbers at conspicuous locations at site.

Department shall conduct independent Incident Investigation to find root cause and preventive measures are adopted to prevent its reoccurrence. Contractor shall provide full co-operation for completion of incident investigation by Department.

1.9.7. Site Emergency Response Action Plan

Contractor shall prepare a detailed site emergency procedure and it shall be communicated to all the employees at site. An emergency response team shall be formed to tackle such emergency situations.

Contractor shall ensure that an Emergency Response Plan is prepared to deal with emergencies such as

- Fire and explosion
- Collapse of lifting appliances and transport equipment
- Gas leakage or spillage of dangerous goods or chemicals
- Excavation collapse
- Fall of person from height



1.9.8. **Work Permit System**

Contractor shall obtain work permit, safety permit and electrical safety permit as a blanket work permit system from Department prior to commencement of work.

Department has the right to cancel the work permit without assigning reasons. When called upon to stop the work by the Department, the Contractor shall immediately cease to continue the work. Before re-commencement, fresh work permit shall be obtained.

In addition, Contractor shall formulate the work permit system at least for the following activities.

- Hot Work (Fabrication including Welding, Grinding and Gas Cutting)
- Working at Height
- Excavations
- Lifting Operations
- Electrical Works (Isolation & Energisation)
- Confined Space Entry
- Pressure testing
- Radiography
- Commissioning of equipment

Contractor shall strictly comply all the safety measures stipulated in the respective Work Permits before starting of the work.

A copy Permit to Work shall be displayed, during its validity, in a conspicuous location in close proximity to the actual works location to which it applies.

1.9.9. **Personal Protective Equipment**

Use of Personal Protective Equipment (PPE) is mandatory and the Contractor shall provide all necessary PPE to their workmen and ensure compliances of wearing necessary PPE inside worksite.

As a minimum, all personnel shall wear safety shoes and safety helmet at worksite. Depending upon the job requirement other PPE shall be used.

Contractor shall:

- Issue PPE at free of cost to his employees.
- Maintain records of issue and replacement of PPE.
- Maintain 10% PPE stock of total requirement available at their store and stock record.



- Maintain all personal protective equipment in good working condition.
- Periodically check and replace all defective / broken personal protective equipment.

1.9.10. **Housekeeping**

Contractor shall maintain very high standard of housekeeping at all times.

- Keep the site neat and tidy. Keep adequate number of waste bins.
- Keep the access clear of all obstructions.
- Remove the nails or bend them down from the wooden scrap and remove them from job site.
- Store the material in an orderly manner.

Contractor shall on daily basis keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by activities. At the completion of day's work, contractor shall remove these materials to avoid fire hazard, slip/ trip hazards and provide safe areas for movement of all workers and supervisors.

Waste generated at site shall be segregated at source and disposed-off in accordance with Department's requirement. Scrap yard shall be identified and waste shall be disposed temporarily at designated scrap yard. Scrap yard shall be barricaded and shall be clearly marked as "Scrap Yard" in English and other local languages.

If the Contractor fails to comply with these requirements, the Department will proceed to clear those areas and the expenses incurred by the Department in this regard shall be payable by the Contractor. When required, Contractor should suspend other activities and do housekeeping.

Before completion of the work, the Contractor shall remove or dispose of, in a satisfactory manner, all scaffolding, temporary structures, sheds, buildings, stores, waste & debris and leave the premise in a condition satisfactory to the Department.

1.9.11. **Electrical Safety**

The Contractor shall employ a full-time qualified Electrician to maintain their temporary electrical installations.

1.9.11.1. **Power Supply**

Department shall provide power termination point at one location, either single phase or three phase based on Contractor's power requirement.



1.9.11.2. Distribution System

The Contractor shall arrange temporary Power Distribution Panel (PDP) with Molded Case Circuit Breaker (MCCB), Earth Leakage Circuit Breaker (ELCB) and calibrated energy meter for taking electrical power from the Department's power termination point.

Necessary power cabling from the Department's power termination point to the Contractor's PDP and from the Contractor's PDP to the Contractor's utility points shall be arranged by Contractor. PDP shall be grouted properly.

Contractor shall ensure that all distribution board (DB) used in the site shall be of IP56 type which specification confirms to national standards. DB with single switch multiple socket system is not be permitted at the worksite.

1.9.11.3. Cables

All temporary cabling must comply with rules & regulations and subject to Department's satisfaction. Armoured cable of suitable rating shall be used for the connections between the Department's power termination point and the Contractor's PDP. All power distribution cables shall be double insulated and of suitable power rating.

After making all temporary power cabling, the Contractor shall formally apply to the Department for Electrical Safety Permit. After ascertaining the compliance of the Contractor's temporary cabling with the Department safety regulations, the Department will energize the Contractor's PDP.

All power distribution cables should be taken overhead with sufficient headroom. Cabling passing under the walk way and across way for transport and mobile equipment shall be laid in ducts at a minimum depth of 0.6 meters.

1.9.11.4. Plugs, Sockets and Couplers

The contractor shall ensure plugs; sockets and couplers used shall be IP56 in accordance with national standards. Cable connectors shall only be used to connect cables.

Plugs shall be used to connect with sockets. Inserting the bare cables into the sockets is strictly prohibited.

1.9.11.5. Electrical Tools and Equipment

Contractor's electrical tools & equipment like welding, drilling, cutting and grinding machines shall be in good condition. The Department will not grant permission to plug-in until the Department is satisfied with the condition of power tools and electrical equipment



Contractor shall have separate welding return cable. The test-stand structures/pipelines shall not be used for return path. Power cables and welding cables shall be routed properly.

In no circumstances, the Contractor shall interfere with fuses and electrical equipment belonging to the Department or other contractors. Before the Contractor connects any electrical appliance to any plug or socket, Contractor shall

- a. Ensure the Department that the appliances are in good working condition
- b. Inform the Department of the maximum current rating, voltage and phase of the appliance
- c. Obtain permission of the Department detailing power requirement, to which the appliance may be connected.

1.9.11.6. Earthing

Body of electrically operated tools, equipment, distribution board, electrical panel etc. shall be grounded properly.

Earth pit shall be clearly marked and earth resistance shall be measured on monthly basis and register shall be maintained by contractor.

1.9.12. Excavation

Contractor shall stabilise the sides of an excavation by designing the shoring, if the depth is 4 meters or more.

All excavations and trenches depth of 600mm or more shall be hard barricaded.

- The hard barricade shall be made of steel pipes of minimum 40 NB.
- The hard barricade shall have hand rail at 1100mm and mid rail at 550mm and the spacing between two vertical members should not be more than 1000mm.
- The hard barricade shall withstand a lateral load of 100 kg.
- The hard barricade shall be provided at least 1.0 meter away from the edge of the excavation.

Excavations and trenches depth less than 600mm shall be cordoned off and suitable sign boards & warning tapes shall be posted.

Access shall be provided by means of portable ladder or ramp if the depth is more than 1.5m.



All excavated materials shall be deposited minimum 1.5 m away from the edge of the excavation. Excavating equipment and vehicle shall be operated 2.0 m away from excavated area.

1.9.13. **Hot Work**

Any work involving open flame/ spark shall be considered as hot work. Fire watcher shall be engaged for each hot work activity and shall be competent in using fire extinguishers. Fire extinguisher shall always be kept near hot work area, preferably a dry chemical powder type.

Work area beneath or adjacent to hot works shall be made free from combustible materials, and cordoned-off to prevent personnel being injured by welding spatters. Barriers or screens shall be erected whenever necessary to protect the workmen working nearby. Contractor shall use non – asbestos fire blankets wherever required to contain falling of spatters.

Suitable safety signs & notices shall be displayed near the hot work area. Appropriate PPE shall be used depending up on the hot work activity.

For welding activity, the Contractor shall ensure,

- The welding transformer shall have separate on/ off switch. It shall be kept away from any wet area and shall be located close to work site.
- The body of the welding transformer shall be properly earthed. Grounding from welding return connection shall be done only on work piece. Return connection shall not be grounded with scaffold member, pipe racks or any other test stand structure.
- The size of the cable used shall be proportional to the voltage supply. The length of supply cable to welding transformer shall not exceed 5 m.
- Lugs shall be used for connecting the lead and return cables with welding transformer. Damaged supply and lead cables are not used.
- The electrode holder handle shall be of non-metallic body.
- Used electrode shall be collected and disposed properly.

For gas cutting activity, the Contractor shall ensure,

- All gas cutting sets shall be kept at upright position and fastened in the trolley. Cylinder valve key shall be made available all the time along with the cylinder when on use.
- Domestic type LPG shall not be used at the site.
- Approved type Non-return valve shall be fixed at torch end and Flashback arrester shall be fixed at cylinder end. All gas cylinders shall be fixed with pressure regulator and double head dial gauges.



- Hoses used shall be free from any damage. Soap solution test shall be carried-out on the entire length of hoses to check any leak. Hoses quality shall confirm BIS. Also Red hose shall be for fuel gas and blue hose for oxygen. Hose clamp shall be used to connect hoses firmly in both sides of cylinders and torch.
- Cutting torch showing any physical damage shall be immediately replaced. Cutting torch nozzles shall be cleaned before commencing the job to avoid any backfire.
- The cutting torch shall be ignited by friction lighter. Igniting by match-box and welding arc is strictly prohibited.
- Gas cylinders shall not be placed beneath the hot work area.
- Empty/ full cylinders shall be handled by the means of trolley. Valve protection cap shall be fitted on the cylinder while shifting and storing.

For grinding/ cutting Activity, the Contractor shall ensure,

- Grinding/ cutting activity shall be always carried out by trained and experienced person.
- Only reinforced resin-bonded or resin-bonded abrasive wheels must be used in portable grinding machines. Grinding wheels should be stored in dry place and shall avoid direct contact of heat. Wet or soaked grinding wheels shall not be used.
- The RPM of grinding/ cutting wheel should be equal or greater than the machine's spindle RPM. Grinding Wheels should be segregated size wise to avoid wrong selection of the wheel. Grinding wheel fitted shall be of suitable size for the grinding machine. Wheels shall not be used at any time beyond their expiry date. Grinding wheel without manufacturer's specification showing size, speed and expiry date shall not in used.
- Power supply cable used shall be of rated current carrying capacity with plug-top and shall be free from damages. Supply shall be routed through ELCB.
- Machine selected shall be of non-metallic body. Body earthing shall be ensured the in case of metallic body.
- All grinding/ cutting machines shall be used with guard. It shall be fitted with Dead-Man switch and this shall not be bypassed any time. Machine shall be put OFF from the main switch when not in use.

1.9.14. **Compressed Gases and Combustible Liquids**

Contractor shall obtain permission from the Department for taking combustible liquids such as Diesel/ Kerosene, compressed gas cylinders such as Oxygen, LPG/DA into department's site.



For compressed gas cylinders, Contractor shall ensure that,

- Handling and Storage of gas cylinder shall comply “Gas cylinder rules 2003”.
- Oxygen cylinders and fuel gas cylinders shall be stored separately, at least 6.6 meters apart or separated by a fire proof, 1.6 meters high partition. Flammable substances shall not be stored within 15 m of cylinder storage areas.
- Valve protection caps over the cylinder shall be provided in storage yard as well as while not in use. All compressed gas cylinders shall be used, stored and transported in an upright position.
- Cylinders should be stored in suitably designed racks, which must have chains so that any number of cylinders can be securely and safely stored.
- Signs indicating the contents with separate storage for “full” or “empty” shall be displayed. Warning signs must be posted - “DANGER - HIGHLY FLAMMABLE - NO SMOKING and NO NAKED FLAME”.
- Oxygen cylinder shall be separated from other combustible gas, oil or grease.

For combustible liquid, Contractor shall ensure that,

- The handling and storage of combustible liquids shall comply “The Petroleum Act, 1934 and Rules 1976”
- Flammable and combustible liquids must be stored in a metal storage cabinet with a prominent sign boards “FLAMMABLE - NO SMOKING and NO NAKED FLAME”.
- The area should be well ventilated and free from flammable material.

Contractor shall provide adequate quantity of fire extinguisher within accessible distance at the storage area of compressed gas cylinders and combustible liquid.

1.9.15. **Work at Height**

Working at height is work involving above 1.8m from ground level that include all work activities where there is a need to control the risk of falling which is able to cause personal injury. It includes working on scaffolds, access and egress through ladder and working near unprotected excavation.

- The contractor shall ensure that work at height is carried out only when the weather conditions do not endanger the safety of persons involved in the work.
- Life line shall be installed and full body safety harness with double lanyard of 1.8m with shock absorber and scaffold type snap hook shall be used to



ensure 100% protection.

- Ladders shall be only used as access for ascending and descending. Using scaffold member as access is strictly prohibited.
- No loose materials shall be kept on working platform to avoid fall of materials from height.
- Scaffolding shall be properly designed and erected, with its intended use, where additional, anticipated loads are to be applied; the structure shall be redesigned and modified accordingly. All scaffolding material shall be as per relevant IS specification.
- Fixed scaffold shall be used for working at height. Scaffold should be vertical and plumb. The footing shall be placed on leveled and firm ground capable of carrying indented load without settling or displacement. Base plate shall be provided at a size of 150 mm X 150mm and thickness of not less than 6mm. Uses of concrete blocks, barrels, boxes, loose bricks as supports are strictly prohibited.
- Scaffold shall be provided with hand rail at a height of 1100mm, mid rail at 600mm and toe board width shall be 150mm. Working platform shall be provided and shall be secured properly to avoid toppling. Access to scaffold shall be by means of portable ladder and it shall be extended at least 3 rungs from platform.
- Mobile scaffold is strictly prohibited for outdoor activities.

1.9.16. **Material Handling**

Material handling includes manual handling, lifting equipment, lifting gears & slings and lifting of materials.

1.9.16.1. **Manual Handling**

Contractor shall ensure that no adult man shall be allowed to lift the load above 55 kg. Capability of worker for manual material handling should be considered in before assigning the task. Contractor shall train the workmen on safe lifting posture.

Whenever material handling operations are essential, consideration should be given to the use of mechanical handling, like use of lifting appliances or fork lifts. The contractors should consider the use of such mechanical aids at the planning stage of their activities.

1.9.16.2. **Lifting Equipment**

All lifting equipment such as mobile crane, forklift, chain pulley block shall be thoroughly tested and examined by a competent person and the test certificate shall be submitted to Department for verification.



Safe Working Load (SWL) shall be clearly displayed on lifting equipment. Hooks shall be fitted with safety latch on hook opening so that slings cannot be displaced.

Hydraulic mobile crane alarms and signals like safe load indicators (SLI), boom angle indicators, boom extension indicators, over lift boom alarm, swing alarm, hydraulic safety valves, mechanical radius indicators, etc. shall be periodically examined and maintained in working condition.

Chain pulley blocks are designed for lifting the loads vertically and shall not be used to pull the loads horizontally.

1.9.16.3. Lifting Gears & Slings

All lifting gears such as block, hook and shackles and slings such as wire rope slings, synthetic web slings, chain slings and metal mesh sling shall be thoroughly examined at least once in every twelve months by a competent person. Contractor shall submit manufacturer's test certificate and test certificates issued by competent authority for all of his lifting gear and slings to Department for verification.

The Safe Working Load (SWL) and manufacturer's serial numbers shall be clearly marked on the slings and the lifting gears, either by tagging, stamping, engraving or embossing. These markings on lifting gears and slings shall be inspected and a register shall be maintained by Contractor. If SWL and manufacturer's serial numbers is not clearly marked, those slings and lifting gears shall be prohibited to use.

1.9.16.4. Lifting of Materials

Contractor shall designate a rigging coordinator who shall have adequate knowledge, skill, experience, qualification and training who shall successfully demonstrate to solve problems related to safe crane operation. This rigging coordinator shall prepare a rigging plan, supervise and control all lifting activities.

The outrigger of the crane shall be fully extended prior to the lift and shall be padded on firm base. Lifting activity shall not be carried out when wind velocity exceeds 25km/h or during other adverse condition.

Contractor shall deploy only the riggers having sufficient knowledge, experience and skill. A 'trial' lift shall be carried out, raising the load above its pick-up point, to check the stability of the crane, and the efficiency of the brakes.

Tagline shall be used to control the load swing. Crane boom swing radius shall be barricaded and safety sign boards shall be displayed. No person shall move beneath the load and travel on the load.



Signal man shall be provided with retro-reflective jacket and he is the only authorised person to give signal to the operator.

1.9.17. **Radiography**

Radiography camera must be operated only by licensed radiographers certified by BARC under the direct supervision of site engineer.

The movement of isotope source for radiography purpose shall be permitted only with the prior approval of Atomic Energy Regulatory Board (AERB). The Contractor shall construct necessary building to store the isotope sources at suitable location to be identified by the Department.

Field radiography shall be carried out during night time where there is no occupancy around.

Radiographer shall wear personnel monitoring badges.

The area shall be cordoned-off whenever radiography is carried out and the distance to be cordoned-off is determined by the type and strength of radiation source to be used, the type of exposure given, nature of occupancy and the total exposure time per week. The radiation levels along the cordon should be monitored by suitable and calibrated radiation survey meter to confirm the cordon-off distance is adequate. All safeguards should be implemented to ensure that workmen are not crossing the barricades.

Radiation warning symbols shall be conspicuously posted along the cordon-off area. The boundary of cordon on all sides shall be adequately illuminated throughout the duration of radiography. Red warning lights must be posted along boundary of cordon and especially at the point of entry.

1.9.18. **Hand Tools**

Contractor shall ensure that all hand tools used shall be of correct type, size and weight for the job. Hand tools used for electrical operations shall be properly insulated and shall be non-conductive type. Defective hand tools shall be immediately discarded from the worksite.



1.10. **QUALITY ASSURANCE**

- 1.10.1. The reliability of the system is a combination of specification of the equipment/ components, serviceability and maintenance of the same, which are meant to serve for a minimum period of 25 (Twenty Five) years for effective and timely preparation/ testing, which includes trouble-free performance of systems and subsystems to the intended specification.
- 1.10.2. The Contractor must look for the quality factors individually attributed to engineering developments, redundancy philosophy adopted, selection of equipment and components, test and acceptance procedures followed, repetitive performance achieved, risk analysis carried out, etc.
- 1.10.3. Ultimately, the reliability of the system is assumed to have been achieved if all the equipment and components of the servicing facility are in serviceable condition whenever the system responds to the commands executed as per the definition and specification.
- 1.10.4. The expected value of probability of the trouble-free operation of various equipment, components and also the total system need to be estimated based upon their selection criteria and their past performance.
- 1.10.5. The quality assurance is a unified approach that attempts to control the quality right from design stage to commissioning stage, which includes the checking of the adequacy of the equipment/ components for materials, fabrication, erection, testing. It is the combined responsibility of the Contractor and the Department to ensure that all possible failure modes are exercised during the mockup trials.
- 1.10.6. This may be ensured by following the general requirements as given below:
 - a. Establishment and enforcement of standard engineering practice
 - b. Evaluation of products at each stage of development process

For the purpose of confirmation of the above aspects, the documents such as functional documents and mathematical formulation document shall be prepared and reviewed wherever applicable.



1.11. **RIGHTS OF THE DEPARTMENT**

1.11.1. **Change and Modification to Specification and Qualitative Requirement**

- 1.11.1.1. The Department shall reserve the right at any time to modify the qualitative requirements, specifications, patents or drawings relating to the work covered by the Contract.
- 1.11.1.2. The Department may also accept modification proposed by the Contractor on their own initiative or on behalf of the Sub-contractor(s).
- 1.11.1.3. As long as the intended functional scope of the Contract is not altered, the aforesaid changes and modifications shall be accommodated within the lump-sum total price of the Contract.
- 1.11.1.4. If the aforesaid changes and modifications amount to alteration of the intended functional scope of the Contract, the implication on price and execution schedule shall be finalized as per Section **Error! Reference source not found.**

1.11.2. **Illustration and Explanation of Plan**

- 1.11.2.1. The various parts of the Contract are intended to be complementary to one other, but should any discrepancy appear or any misunderstanding arises, the explanation of the Department will be final and binding.
- 1.11.2.2. The correction of any error or omission of specification may be made by the Department when such correction is necessary to bring out clearly the intention which is indicated by a reasonable interpretation of the specification as a whole.
- 1.11.2.3. Wherever, in the specification which is a part of the Contract or which may be furnished to the Contractor for directing the work, the terms and descriptions of various qualities of workmanship, materials, structures, processes, plant or other features of the Contract are described in general terms, the meaning or fulfillment of which must depend upon individual judgments, then in all such cases, the question of interpretation shall be decided by the Department and said material shall be furnished, said work shall be done and said structure or feature shall be constructed, furnished or carried out in full and in accordance with their interpretation of the same and to their full satisfaction and approval of the Department, provided such interpretation is not in direct conflict with the specification or generally accepted good practice.

1.11.3. **Direction of Work**

The work by the Contractors at site beyond normal working hours (08:45 to 17:15 hr.) on working days and any time on holidays (including Saturdays and Sundays) shall be permitted only with prior approval of the Department, which shall not be unreasonably withheld. The Department may also direct the



Contractor to operate extra shifts over and above normal day shift to ensure completion of the Contract on schedule if, in the opinion of the Department, such work is required.

1.11.4. **Ordering Modification of Method and Equipment**

If, at any time, the Contractor's methods, materials or equipment appear to the Department to be unsafe, inefficient or inadequate for securing the safety of the workmen or the public, the quality of work or the rate of progress required, the Department may order the Contractor to ensure their safety and increase the efficiency & adequacy and the Contractor shall promptly comply with such orders. If, at any time, the Contractor's work-force and equipment are, in the opinion of the Department, inadequate for securing the necessary progress, as herein stipulated, the Contractor shall, if so directed, increase the work-force and equipment to such an extent as to give reasonable assurance of compliance with the schedule of completion. The absence of such demands from the Department will not relieve the Contractor of their obligations to secure the quality, the safe conducting of the work and the rate of progress required by the Contract and the Contractor alone shall be and remain liable and responsible for the safety, efficiency and adequacy of their methods, materials, work-force and equipment, irrespective of whether or not they make any change as a result of any order or orders received from the Department.



1.12. **INSTRUCTION TO BIDDER**

The proposals are invited on behalf of the President of India by the Head, Purchase & Stores, IPRC, Mahendragiri, from the Bidders for the work described in this RFP document for IPRC, Mahendragiri. **The bids shall be submitted online on IPRC e-procurement portal eprocure.isro.gov.in.**

- 1.12.1. **Scope of Work:** The scope of the work is establishment of Water Based Fire Protection System at Semicryogenic Integrated Engine Test Facility **on Lump-Sum Turn-Key (LSTK) through Engineering, Procurement and Construction (EPC) mode** as per the specification given in this document. **The Contractor is required to submit a complete bid for the entire work mentioned herein. Any incomplete bid will be summarily rejected.**
- 1.12.2. **Pre-Bid Meeting:** It is proposed to brief the Bidders on the requirements of this RFP at IPRC, Mahendragiri and date of the pre-bid meeting may be referred in the tender notice. **Bids submitted by bidders participating in pre-bid meeting shall only be considered for tender evaluation.**
- 1.12.3. **Execution Period:** The entire work is to be completed within **15 (Fifteen) months**. The Contractor shall submit a master schedule detailing their realization plan so as to comply with the overall execution period stated herein, in the form of a Gantt chart, indicating the sequence and duration of the various phases of work.
- 1.12.4. **Validity:** The bid submitted shall be valid for a period of **6 (Six) months** from the due date for opening of the techno-commercial bid.
- 1.12.5. The Department reserves the right to reject any or all bids in whole or part without assigning reason thereof.
- 1.12.6. **Form of Bid:** Bid shall be submitted in 2 (Two) separate parts viz. **Part 1 for Techno-commercial bid and Part 2 for Price bid.**
- 1.12.6.1. **Techno-Commercial Bid:** The techno-commercial bid shall give the complete details on technical & commercial aspects only. **The techno-commercial bid shall not contain any price detail. Mention of any price detail in the techno-commercial bid will render the entire bid invalid.** The techno-commercial bid may include a format of the price bid by the Contractor, without any detail of the price quoted. Deviation, if any, in the Contractor's proposal with respect to this document shall be explicitly mentioned in the schedule of deviations to be provided in the bid. If the Contractor does not mention any deviation, it shall be construed by the Department that the Contractor agrees to comply with each and every aspect of this document.
- 1.12.6.2. **Price Bid:** The bidder shall provide break-up prices in the price format given on the e-procurement portal. Total price shall be given in words and numerals, including Currency.



1.12.7. **Online Bid Submission**

The instructions to the Bidders for online submission of their proposals on IPRC e-Procurement portal are as follows:

- 1.12.7.1. The Bidders shall arrange all resources, including Digital Signature Certificates (DSC) and Internet connections, at their own cost for participating in online bidding.
- 1.12.7.2. The bid shall be submitted online in the IPRC Centre link before the due date and time as specified in the tender schedule in the portal.
- 1.12.7.3. All enquiries regarding the tenders and submission of offers shall be online and only through our e-Procurement portal.
- 1.12.7.4. The Bidder may approach helpdesk on the home page for any technical help (e-mail: support.isro@nextenders.com and Phone: 0091 20 2531555)
- 1.12.7.5. In case the Bidder encounters any technical snag pertaining to e-Procurement system while acting on the tender, computer screenshot of the error message with date & time stamp on the web-browser along with the query shall be emailed by the Bidder to the help desk (as mentioned above) for problem resolution at least 24 hours before the due date and time of the bid submission.
- 1.12.7.6. The time taken to ascertain, evaluate and suggest a solution for the problem reported by the Bidder may vary from case to case. Hence, the Bidders are advised to submit the bid well in advance before closing date and time to avoid last-minute issues.
- 1.12.7.7. The Department will not be responsible for failure of the Bidders in submitting bids online caused due to technical reasons at the Bidder's end such as network or power failures, computer failure, internet browser, mistakes/ errors in filling the bids online, etc.
- 1.12.7.8. Queries by the Bidders on technical problems on the last day of bid submission will not be binding on the Department for resolving/addressing. The Department will not be responsible for non-submission of bids in those cases.
- 1.12.7.9. The Server Date & Time as appearing on our website (<https://eprocure.isro.gov.in>) shall only be considered for the cut-off date and time for receipt of bids.
- 1.12.7.10. The e-procurement system does not permit submission of any bid after closing date and time of the e-tender. Hence, there is no scope for any late or delayed bid in the online process.



- 1.12.7.11. The Bidders have to note that once rework is initiated, the status of the earlier submitted bid becomes pending till the bidding process is completed once again. During the process of rework, bid data submitted earlier becomes invalid and will not be available for opening. If rework is initiated, then Contractor has to complete the entire process of bid submission once again within the due date and time for a valid bid submission.
- 1.12.7.12. The Department will not be responsible for non-submission of bids resulting due to failure of the Bidder to once again complete the process of bid submission before due date after reworking of the submitted bid is initiated.
- 1.12.7.13. Any unsolicited clarification/ change/ modification sought by the Bidders after submitting their bids will not be considered.
- 1.12.7.14. The Bidders shall note that since this is a two-part bid, **the price details shall be mentioned only in the price-bid template. If the price details either in part or full are indicated in the technical bid, the bid will be disqualified.**
- 1.12.7.15. The Bidders may note that, in e-procurement system, submission of bid is a 2-step process. After submission of their bids, the Bidders have to wait for bid sealing by the Department. Following that, the Bidders have to submit open authorization in the e-procurement system to enable the Department to open the bid. If open authorization is not completed by the Contractor, then the Department will not be able to open the bid and the bid becomes invalid.
- 1.12.7.16. The Bidders may note that digital keys of Class-III USB tokens, which support both digital signing and encryption are to be used for bidding in IPRC e-procurement system
- 1.12.7.17. The Bidders may note that they have to use the same digital key with which they submitted the bid to give open authorization. If the Bidders use different key for open authorization, the system will not accept the open authorization and the bid becomes invalid
- 1.12.7.18. In case the digital key which is used during bid submission expires before giving open authorization, then the Bidder has to first login with the new key and use the expired key for completing open authorization process for the bid.
- 1.12.7.19. The Bidders may note that the maximum file size that can be uploaded per attachment in e-procurement system is 4 MB (in pdf format). If the document is more than 4 MB, then the document is to be split into multiple documents of size less than 4 MB and uploaded into attachments. Literature/ Technical data should accompany the bid.
- 1.12.7.20. Similarly, if the number of files to be uploaded is more than the number of attachments allowed in the bid, then the files are to be grouped into folders such



that the number of folders is less than the number of attachments. Further, the folders may be compressed using zip/archive format and uploaded as attachments. However, the attachment size should still be less than 4 MB.

- 1.12.7.21. The Bidders may note that documents including literature/ technical data are to be uploaded on e-procurement portal only.
- 1.12.7.22. Bids sent through post, telegram, fax, telex, e-mail, courier, etc. will not be considered. Partially completed/ incomplete bids will not be considered.
- 1.12.8. The Bidder shall submit a memorandum of undertaking as per the following format:



MEMORANDUM OF UNDERTAKING

I/ We hereby submit the bid for the execution for the President of India of the work specified in the underwritten memorandum within the time specified in such memorandum, at a total price as specified and in all respects in accordance with the specifications, design, drawings and instructions in writing referred to in this document and with such materials as provided for by and in all other respects in accordance with such conditions as are applicable.

Should this tender be accepted in whole or in part, I/ We hereby agree to abide by and fulfill all the terms and provisions of the said conditions annexed hereto and all the terms and provisions contained in the tender enquiry documents which have been read by me/ read and explained to me so far as applicable or in default thereof to forfeit and pay to the President of India or his successors in office the sum of money mentioned in the said conditions.

I/ We agree to execute all the works referred to in the RFP document upon the terms and conditions contained or referred to therein and to carry out such deviation/ variation as may be ordered in excess of original scope at the rates to be determined in accordance with the provision contained in this document.

Witness

Bidder

(Signature)

(Signature)

Name:

Name:

Designation:

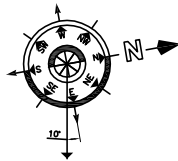
Designation:

Address:

Address:

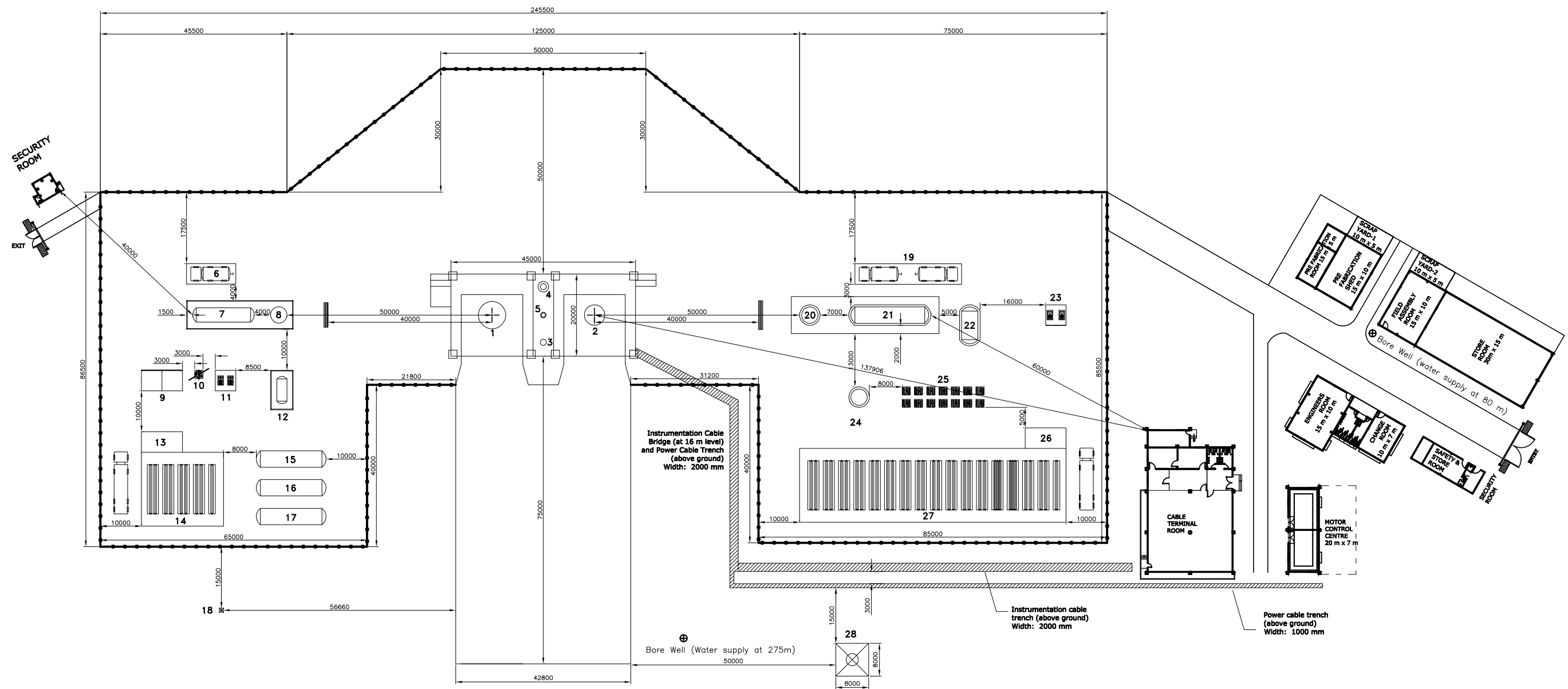
For use by the Department only

The above bid is hereby received by me on behalf of the President of India on
_____.



EQUIPMENT LAYOUT OF INTEGRATED ENGINE TEST FACILITY

- NOTES:
- 1.ALL DIMENSIONS ARE IN 'mm'. UNLESS OTHERWISE MENTIONED.
 2. PAVEMENT AREA IS ABOUT 20000 SQM (APPROXIMATELY)



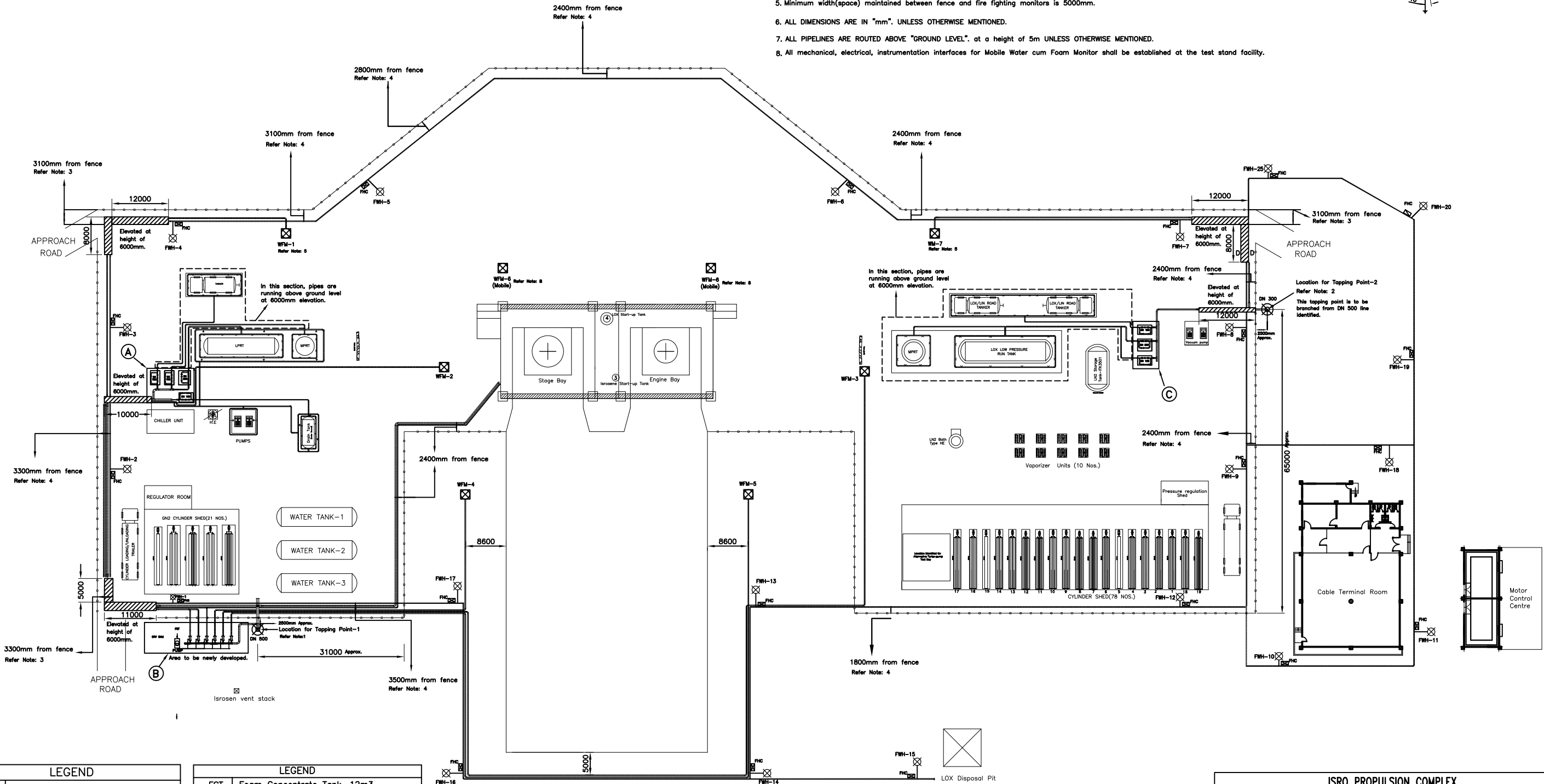
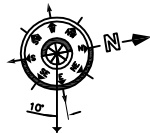
SL.NO.	DESCRIPTION	DIMENSIONS (mm)				APPROXIMATE WEIGHT IN TONNES
		DIAMETER	LENGTH	BREADTH	HEIGHT	
1	STAGE TEST BAY		20000	20000	52000	1400
2	ENGINE TEST BAY		20000	20000	32000	1400
3	ISROSENE STARTUP TANK	1500			4500	7.5
4	LOX STARTUP TANK	2500			6000	16
5	LOX HIGH PRESSURE TANK	1400			2000	5
6	ISROSENE TANKER BAY		12000	5000		40
7	ISROSENE LOW PRESSURE RUN TANK	3500	15000			180
8	ISROSENE MEDIUM PRESSURE RUN TANK	4000			7000	100
9	WATER CHILLER PLANT		10000	5000	3500	3
10	SPIRAL PLATE HEAT EXCHANGER		2000	2000	2500	2
11	ISROSENE PUMP HOUSE		5000	5000	3500	
12	ISROSENE DRAIN TANK (UNDERGROUND)	2500	6600			40
13	REGULATOR ROOM – ISROSENE AREA		10000	5000	3500	
14	CYLINDER SHED – ISROSENE AREA		20000	18000	5000	150
15	WATER TANK – 1	4000	17000			325

SL.NO.	DESCRIPTION	DIMENSIONS (mm)				APPROXIMATE WEIGHT IN TONNES
		DIAMETER	LENGTH	BREADTH	HEIGHT	
16	WATER TANK – 2	4000	17000			325
17	WATER TANK – 3	4000	17000			325
18	ISROSENE VENT STACK	2000			10000	
19	LOX/LN2 TANKER BAY		26000	5000		80
20	LOX MEDIUM PRESSURE RUN TANK	5000			8600	300
21	LOX LOW PRESSURE RUN TANK	5000	20000			400
22	LN2 STORAGE TANK	5000	10000			170
23	VACUUM PUMP ROOM		5000	5000	3500	
24	LN2 BATH HEAT EXCHANGER	5000			6000	60
25	VAPORISER UNITS		20000	5000	10000	20
26	REGULATOR ROOM – LOX AREA		10000	5000	3500	
27	CYLINDER SHED – LOX AREA		65000	18000	5000	500
28	LOX DISPOSAL PIT		8000	8000	4000	

ISRO PROPULSION COMPLEX MAHENDRAGIRI		
TITLE EQUIPMENT LAYOUT FOR INTEGRATED ENGINE TEST FACILITY		
Drawing No.: LPSC/LMF/TSF/SCTF/EQL/DWG/01-R5		
Paper size: A3	Scale: NTS	Date: 18/10/2013
Prepared by	Approved by	Projection
KP SURESH KUMAR, ENGR.	T RAMESH, MANAGER, SCTF	Sheet 1 of 1

NOTE:

- Flowrate requirement is 1100m³/hr. Pressure required at the tapping point is 8bar and design velocity shall be limited to 2m/s.
CMD shall provide tapping point with isolation valve in underground chamber and SORF Flange interface at 300mm height from ground level.
- Flowrate requirement is 500m³/hr. Pressure required at the tapping point is 8bar and design velocity shall be limited to 2m/s.
CMD shall provide tapping point with isolation valve in underground chamber and SORF Flange interface at 300mm height from ground level.
- Minimum width(space) maintained between fence and trench is 1500mm.
- Minimum width(space) maintained between fence and fire fighting lines is 1000mm.
- Minimum width(space) maintained between fence and fire fighting monitors is 5000mm.
- ALL DIMENSIONS ARE IN "mm". UNLESS OTHERWISE MENTIONED.
- ALL PIPELINES ARE ROUTED ABOVE "GROUND LEVEL". at a height of 5m UNLESS OTHERWISE MENTIONED.
- All mechanical, electrical, instrumentation interfaces for Mobile Water cum Foam Monitor shall be established at the test stand facility.



LEGEND	
(A)	Location of Deluge valves for Isosene Area. Area: 10000mm X 7500mm Deluge Valves: DN 150 - 3 No.s DN 200 - 1 No.
(B)	Location of Foam Skid SRV Skid. Area: 22000mm X 6500mm Surge Relief Valve Skid - 1 No. Foam Concentrate Tank, 12 m ³ - 1 No. Foam Pump - 1 No. Foam Proportionators - 6 No.s Loading: 10T/m ²
(C)	Location of Deluge valves for LOX Area. Area: 10000mm X 5500mm Deluge Valves: DN 200 - 1 No. DN 150 - 2 No.s

LEGEND	
FCT	Foam Concentrate Tank, 12m ³
WFM	Water cum Foam Monitor - 5 No.s (Area required for each WFM is 2000mm X 2000mm)
WM	Water Monitor - 1 No. (Area required for WM is 2000mm X 2000mm)
FWH	Fire Water Hydrant - 25 Nos. (Area required for each FWH is 1000mm X 1000mm)
FHC	Fire Hose Cabinet - 25 Nos. (Area required for each FHC is 1500mm X 750mm)
(X)	Fire water tapping point at Isosene Area
(X)	Fire water tapping point at LOX Area
SRV Skid	Surge Relief Valve Skid

ISRO PROPULSION COMPLEX, MAHENDRAGIRI		
TITLE: LOCATION LAYOUT OF WATER BASED FIRE PROTECTION SYSTEMS FOR SIET FACILITY		
Drawing No.: IPRC/S&FS/SIET/FIRE Fighting Systems/R1		
Paper size: A1	Scale: NTS	Date: 30/12/2016
Prepared by	I Arun, Engr- SD VSHRC Raju, Engr-SD	Projection
Reviewed by	R Suresh, Dy Mgr., PSCFS	
Approved by	P Palvannan DGM, S&FS	